

# ■ **FLIGHT** ■

*Supplement:*



*Aviation*  
**CLOTHING**  
*and*  
**ACCESSORIES**

# **THE GENERAL AERONAUTICAL Co., Ltd.**

**CONTRACTORS TO H.M. GOVERNMENT,**

**30, REGENT STREET,  
PICCADILLY CIRCUS,  
LONDON, S.W.**

Telegrams :  
"SANTOCHIMO, LONDON."

Telephone :  
280 GERRARD.

# **G.A.C.**

## **WORKS :—**

**5, HYTHE ROAD,  
CUMBERLAND PARK,  
WILLESDEN JUNCTION,  
LONDON, N.W.**

# GENERAL AVIATION ACCESSORIES.

**The Acetylene Corporation of Great Britain, Ltd., 49, VICTORIA STREET, WESTMINSTER.**

A SPECIALITY of this firm is a new portable carbide-to-water acetylene generator made of mild steel sheets welded together by the oxy-acetylene process and the whole galvanised after construction. It takes a charge of 12 lbs. of carbide and is 16½ ins. in diameter by 3 ft. 4 in. overall. Weight empty about 1 cwt. It is claimed that owing to the special design of this generator there is no wastage of gas through after generation when the blow pipes are shut down, and it will deal with any metal up to 1 in. thick. The water used for sealing the bell is separate from the water used for decomposing the carbide; consequently, recharging is very simply and quickly accom-

plished. The manhole cover is unscrewed and the carbide cage removed, the cludge valve is then opened and the centre chamber washed out. The cage is then filled with a fresh charge of carbide and the manhole cover replaced. The gas is thoroughly washed and passed through the purifier before leaving the plant.

**Acetylene Illuminating Co., 268-270, SOUTH LAMBETH ROAD, S.W.**

IN installing an oxy-acetylene welding plant, there are two systems, known respectively as high and low pressure, and the

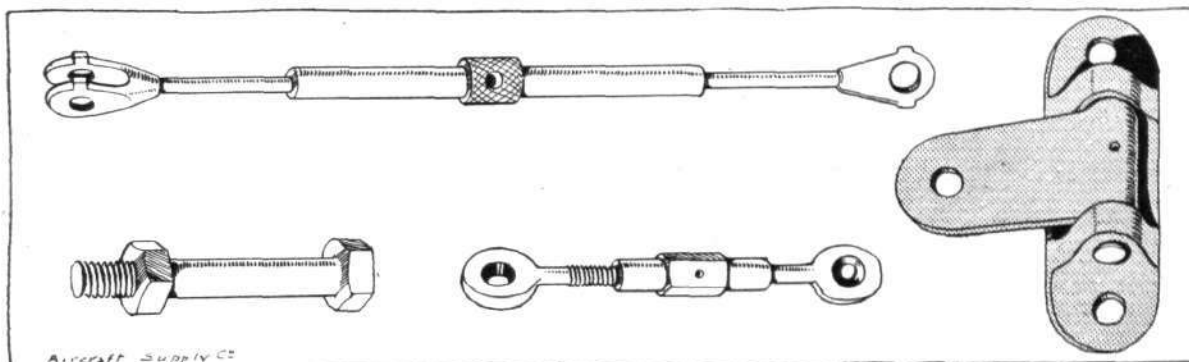
former has several advantages in its favour, two of the most prominent being its portability and the purity of the gas, which is compressed acetylene stored in steel cylinders containing a porous material. The absolute purity of the acetylene when prepared in this way is assured since it is impossible to "dissolve" the gas unless it is first thoroughly freed from all deleterious substances such as sulphur, phosphorus and ammonia.

Dissolved acetylene (D.A.), as it is called when so prepared, is, as is well known, the product of the Acetylene Illuminating Co., a firm who were the actual pioneers of the oxy-acetylene process of welding. Although advocating the high pressure system for all important work, the company also manufacture low pressure plants, in which the

5 mm.; strainers, short; bright hex. bolt; and nuts, 5 by 45 mm. (a very useful size) hex. nuts, A.G.S. 115C, 114B and 118A; and the familiar R. A. F. turnbuckles (A.G.S. 141). From time to time, as the business grows, doubtless other "lines" will be specialised in. A useful institution is the weekly issue of the *A.S.C. Bulletin*, which sets forth the special lines in stock, and those which are available for early or advanced deliveries. A copy can be obtained regularly by anyone interested in the manufacturing side of aviation.

**Anglo-American Oil Co., 36, QUEEN ANNE'S GATE, WESTMINSTER, S.W.**

ONE of the most familiar sights at any aerodrome are the green cans in which Pratt's "Perfection" spirit is packed, and it



Some specialities of the Aircraft Supplies Co.

acetylene is delivered to the blowpipe at a pressure approximately atmospheric from a generator similar in principle to those used for headlights on cars.

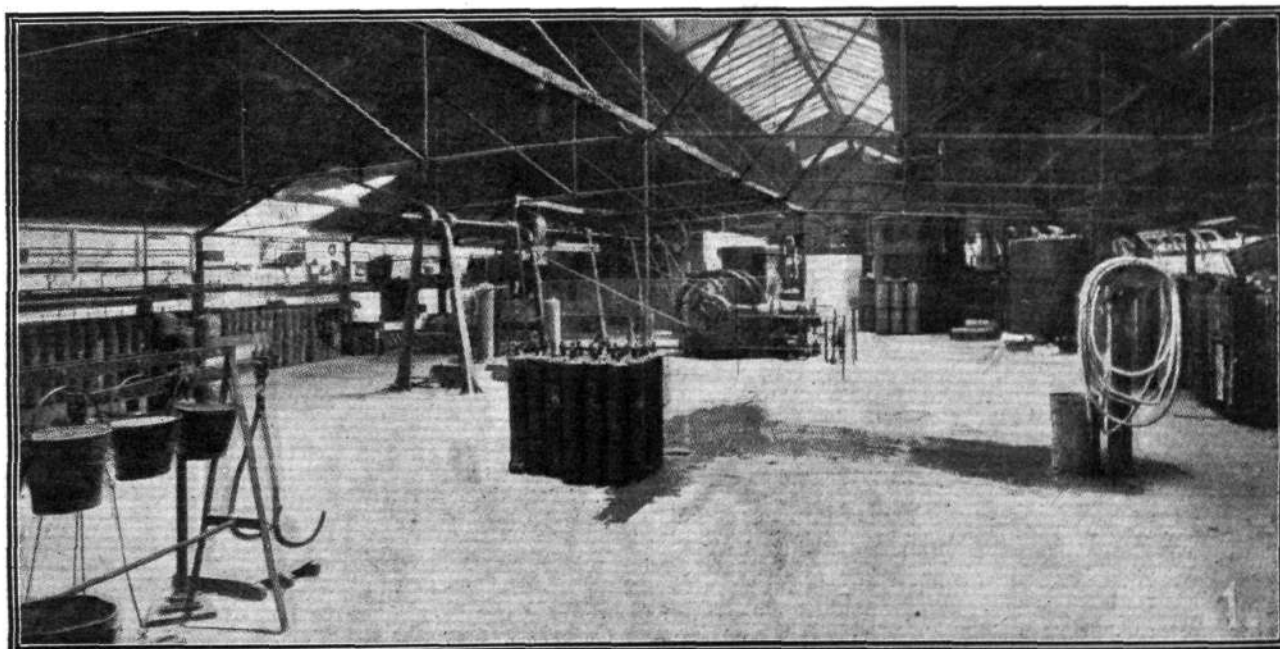
**The Aircraft Supplies Co., 17, JOHN STREET, THEOBALDS ROAD, LONDON, W.C.**

CONCEIVED on unique lines, the policy of this business is to meet the demand for those fittings which the ordinary busy manufacturer in these days finds difficulty in obtaining, a few of these lines being wing-flap hinges (20-21-22 A. 4029), Binet type, 4 and

affords the most convincing proof of the popularity of this motor spirit. Its reliability, purity and economy are too well known to need more detailed reference here.

**The Allied Aircraft Varnish Co., Ltd., 38, FARRINGTON STREET, LONDON, E.C.**

FORMED out of two existing firms both having long experience in fabric and linen varnishes, the Allied Aircraft Varnish Co., Ltd., at the outbreak of war set to work to meet the tremendous demand for dopes, varnishes and paints for all forms of aircraft



Interior of the D.A. compressing works, of the Acetylene Illuminating Co., where the cylinders are charged.



work, the entire production being English manufacture.

The demand for their specialities is large and increasing, and the well-equipped works are turning out supplies of all the above not only for English but foreign Governments, and the firm are fortunate in having command of supplies of raw materials of practically unlimited output.

Their specialities are as follows:—

Dope to R.A.F. specifications; special "A" dope; fabric varnishes (2 sorts); woodwork, copal, propeller, boat, and shellac varnishes; paints and enamels to resist dope.

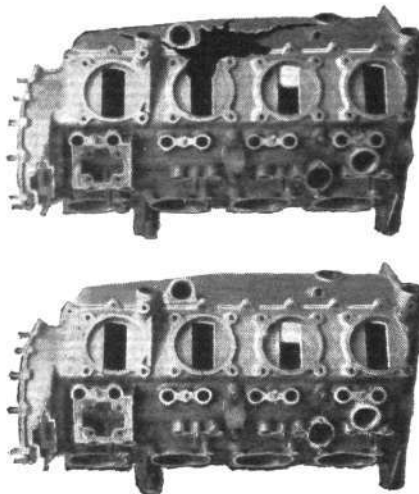
They also carry large stocks of Acetone.

**D. Anderson and Sons, LAGAN FELT WORKS, BELFAST.**

ALTHOUGH in a rapidly expanding industry like aviation, where it is often necessary to make additions in a minimum of time, it is essential that the roofing should be absolutely weather proof. It is in this connection that Messrs. D. Anderson and Sons specialise with their Rok roofing, which is the result of their long experience in the felt trade. To show the length of that experience, it is sufficient to say that the firm was supplying Roofing felt to the British War Office during the Crimean war. Determined to thoroughly test the weather resisting qualities of Rok roofing before it was placed on the market, lengthy trials were carried out in India and other tropical countries, and the firm guarantee it to be the most permanent roofing on the market.

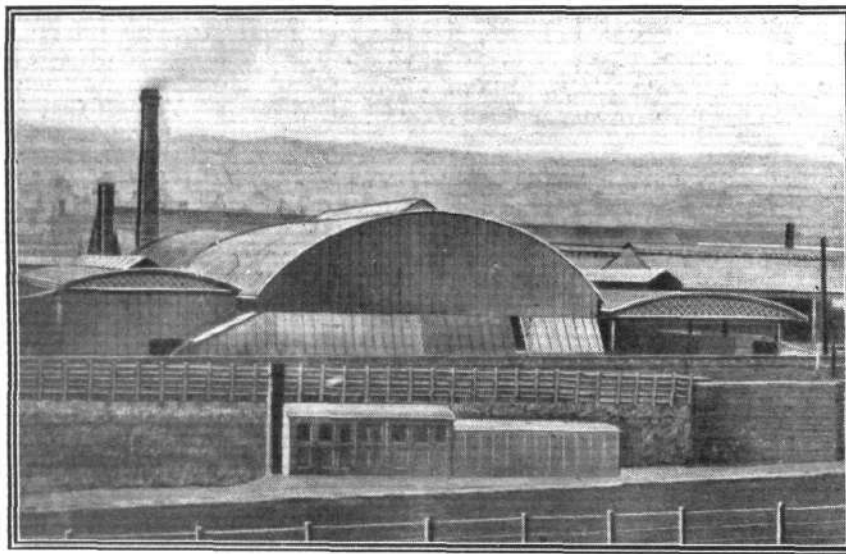
Only the highest grade of wool felt is used in its manufacture. This is saturated with an elastic waterproofing compound, which

aluminium crank-case from an 8-cylinder aeroplane engine. The top and bottom halves and the cylinder base were badly smashed, and the torn cavity shown called for most expert handling, for none of the smashed pieces were available. Barimar effected a perfect repair, lined and machined, and the perfect finish and clean up should be noted in the second illustration. There is



An 8-cyl. crankcase before and after repair by Messrs. Barimar, Ltd.

absolutely no trace of repair. Among welding firms Barimar, Ltd., have set an extremely high standard in repair work in all metals and alloys, and the great economy of Barimar welding is quickly apparent.



An example of the application of Rok roofing by Messrs. D. Anderson and Sons.

does not dry out or evaporate in any climate, as it contains no oils, or volatile matter. The coating on the surface is a permanent one, composed of a natural bitumen of very high melting point. There is nothing of an organic nature in either the saturating or coating compound.

Rok is acid and alkali proof. White ants won't attack it. Rain water from roofs covered with it can be used for domestic purposes. Being an excellent non-conductor, it ensures an even temperature, and is therefore an ideal roofing for hot climates.

**Barimar, Ltd., 10, POLAND STREET, LONDON, W.**

AN interesting example of the efficiency of Barimar welding is afforded by this

**The Blackburn Aeroplane and Motor Co., Ltd., OLYMPIA, LEEDS.**

APART from the building of complete machines, the Blackburn Co. some time ago decided to specialise in the production of various metal parts, and they are now in an advantageous position to supply sheet-steel pressings, steel stampings, machined fittings for B.E. 2c aeroplanes; also turnbuckles, R.A.F. and Admiralty type, special bolts, eyebolts, wheels, &c. Another branch of the business is devoted to the building of propellers in all types and sizes, and so successful has this proved that it has been necessary to make a large extension to the works to meet the demands for more rapid production. In view of the extensive equip-

ment, the firm are also in a good position for the manufacture of tanks, cowls, &c., to any specified design.

**The British Aeroplane Varnish Co., Ltd., 166, PICCADILLY, LONDON, W.**

"TITANINE" is the speciality of this firm, and, as the style of the firm implies, this dope is British made. Several special features are claimed for "Titanine," the most important of which are:—flexibility, imperviousness, flame proof, adhesion, and freedom from Tetrachlorethane.

Flexibility is, of course, a most important feature, and a piece of fabric doped with "Titanine" can be bent or folded again and again without showing any signs of cracking or peeling. At the same time the dope fills in the pores of the fabric thoroughly, and thus prevents varnish, &c., from penetrating to, and rotting, the fabric. The dope itself is absolutely fireproof, and a lighted wax match laid on a plane doped with "Titanine" will just burn completely away without setting fire to the plane. "Titanine" is entirely free from Tetrachlorethane and all poisonous and heavy spirits and is therefore harmless to workers. It dries with a dull surface, and affords a good hold for varnish or paint. Four coats applied in the usual way leave a deposit of about 2 oz. per square yard. The manufacturers state that it has been proved from experience that no dopes resist climatic conditions unless protected by suitable varnish or paints; they have therefore placed on the market a varnish and paints suitable for the purpose.

We also understand this firm are able to fill their customers' requirements with the utmost despatch, an important item in these strenuous times.

**The British Emaillite Co., 30, REGENT STREET, S.W.**

AS announced last week, the new works of this company are now working at full capacity to meet the ever-increasing demands for Emaillite. Throughout the new installation every advantage has been taken of the most modern methods and machinery to ensure that the high reputation for quality and purity which has been won by Emaillite shall be still further enhanced and the works have also been specially organised to supply dopes to all Government specifications. In passing, it may be noted that in all grades of Emaillite the proportion of Tetrachlorethane has been reduced to the lowest possible limit. For identification marks, an Emaillite tightening dope in any colour is supplied. This grade is oil and waterproof, and does not run.

Emaillite finishing varnish, which preserves the doping and increases the durability very considerably, is also being produced at the new works, and extensively adopted by the Government and various constructors.

To facilitate delivery of Emaillite dope and varnish and collection of empty carboys and drums, good use is made of the G.A.C.'s newly converted Chenard-Walcker "lorry," and the firm's clients can invariably rely upon promptitude in despatch.

**British Oxygen Co., ELVERTON STREET, WESTMINSTER, S.W.**

WITH their extensive experience in connection with blowpipe work dating back to a considerable time before the introduction of oxy-acetylene system, the British Oxygen have a considerable advantage. They supply oxy-acetylene (low or high pressure) apparatus for welding and metal cutting, and in our illustration will be found two of their specialities—the "Universal" blow-



Telephone :—4167 Gerrard.  
**MASCHINENFABRIK**  
(Ateliers de Construction)

# OERLIKON

Telegrams :—  
Oerlik. Estrand. London.  
**SWITZERLAND.**

MANUFACTURERS  
OF

**ELECTROLYSERS FOR PRODUCTION OF HYDROGEN & OXYGEN.**

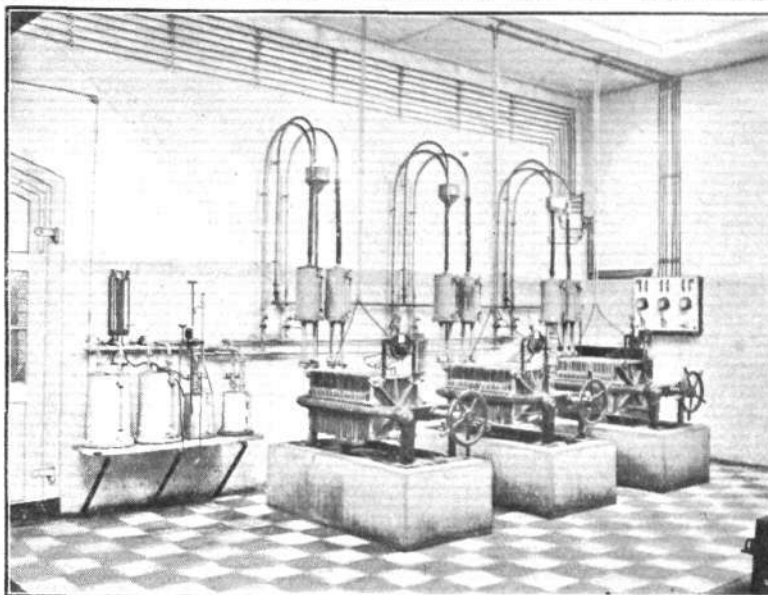
## SPECIALITIES.

Steam Turbines.

—  
**Generators**  
FOR  
DIRECT CURRENT,  
SINGLE PHASE &  
THREE PHASE  
ALTERNATING  
CURRENT.

—  
**Transformers.**

—  
**Motors**  
FOR  
ALL INDUSTRIAL  
PURPOSES.



## SPECIALITIES.

**Electric**  
**Locomotives.**

—  
**Hydro-Electric**  
**Equipments.**

—  
**Electric Cranes.**

—  
**Electric Drills.**

**OERLIKON WORKS**  
**UNDER**  
**WAR CONDITIONS :—**

The Maschinenfabrik (Ateliers de Construction) Oerlikon is a PURELY SWISS undertaking, financed, run and managed by Swiss, and all labour is Swiss up to quite 98%, the remaining 2% being constituted by men from almost all countries in the world. Import facilities mainly from Great Britain, America, &c., and Export facilities via Genoa, Dieppe, Bordeaux, Treport-Cette, &c., and the stocks of raw materials at the Stores enable good deliveries to be given.

BRITISH, IRISH & COLONIAL DEPARTMENT REPRESENTED BY

**G. WÜTHRICH, M.I.E.E., Oswaldestre House, 34 & 35, Norfolk St., Strand, London, W.C.**

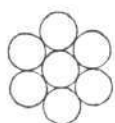
## ***DOES YOUR RIGGING NEED ATTENTION?***

The safety of your rigging is a most vital and essential matter calling for constant care.  
**MESSRS. GEO. CRADOCK & CO., LTD.**—one of the leading flexible wire rope makers in Great Britain,  
make a speciality of the most suitable

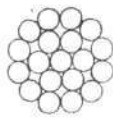
**FLEXIBLE STEEL WIRE STRANDS, CORDS, &c.,  
FOR RIGGING AERIAL CRAFT,**

and any requirements in this direction should be supplied by them.

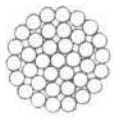
The following illustrations are Sectional Views of some of the flexible strands and cords made by them.



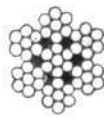
7 Wires.



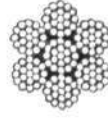
19 Wires.



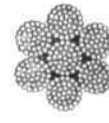
37 Wires.



49 Wires.



133 Wires.



259 Wires.

**GEORGE CRADOCK & CO., LTD.,**

**STEEL WIRE ROPE WORKS, WAKEFIELD, ENG.**

**Contractors to the Admiralty and War Office.**

**LONDON OFFICE :—7, East India Avenue, E.C.**

*Estimates, full details, and immediate and careful attention to all enquiries.*

*When communicating with advertisers, mention of "Flight" will ensure special attention.*

Established 1800




**William Heaton & Sons Ltd.**

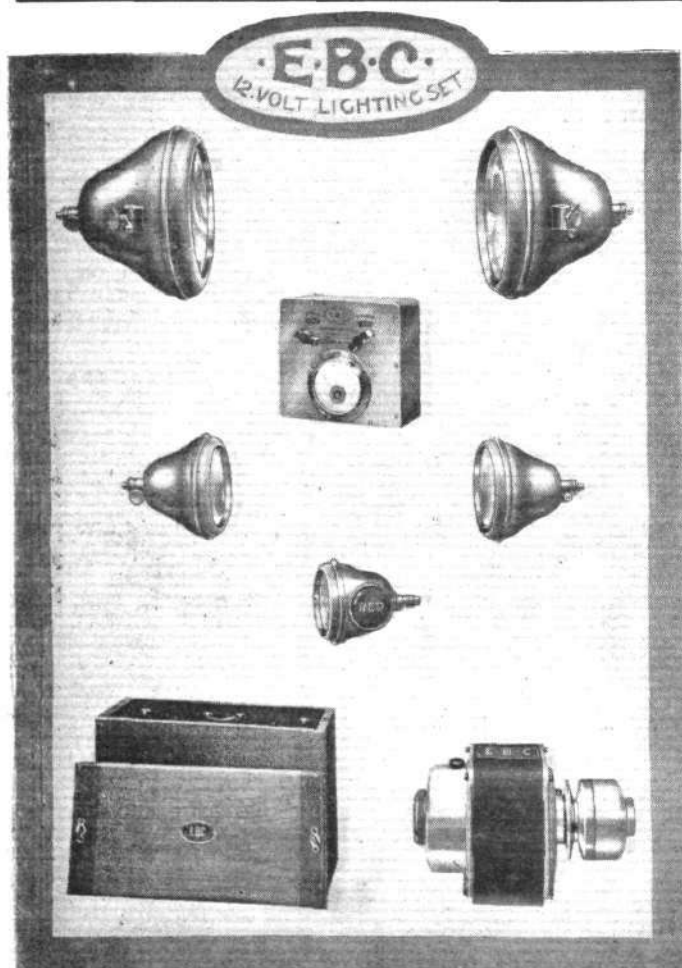
SPINNERS  
OF A SUPERIOR QUALITY OF  
FINE SEA ISLAND YARNS  
SUITABLE FOR  
LACE, MUSLIN, HARNESS TWINE  
& SEWING THREAD  
MANUFACTURERS




Lostock Junction Mills, near Bolton, England.



We have the longest experience in the trade in spinning Special Superfine Combed Yarns for manufacturers of Aircraft Fabric. We do not belong to any ring or combine. 263,000 Spindles.



## THE "E.B.C." DYNAMO ALL-BRITISH LIGHTING SYSTEM.

Specially Designed Set for Light Cars.

FULLY GUARANTEED for TWELVE MONTHS.

### SPECIFICATION 12 VOLT LIGHT CAR SET.

**DYNAMO.** Output 75 watts, 12 volts 6 amperes, with pulley fitted with B.S.A. free wheel.

**SWITCHBOARD.** Fitted with polished and lacquered metal front, combination switches and ammeter.

**ACCUMULATOR.** 12 volts 24 ampere hour actual capacity, in acid-proofed case for fitting to running board of car.

**TWO HEADLIGHTS.** 7½ in. fronts, fitted with adjustable focussing holders and 12 volt bulbs.

**TWO SIDELAMPS (complete with Bulbs).** Torpedo model side lamps can be supplied at same price if desired.

**ONE TAIL LAMP (complete with Bulb).**

**PRICE, complete Equipment, £20.**  
BRASS FINISH.

6 volt Set, same as above Specification, but with 6 volt 50 watt Dynamo and 6 volt 33 ampere hour Accumulator.

**PRICE, complete Equipment, £18.**

Sole Manufacturers and Patentees:

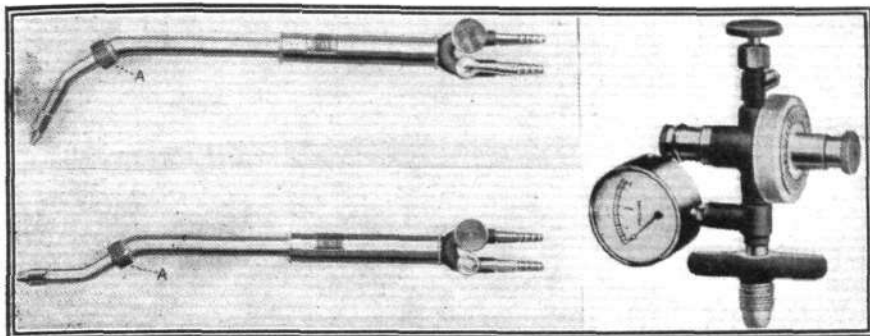
**THE ELECTRIC BATTERY CO.,**

—DYNAMO AND ACCUMULATOR MANUFACTURERS.—  
62, EAGLE STREET, HIGH HOLBORN, LONDON, W.C.

When communicating with advertisers, mention of "Flight" will ensure special attention.

pipe, two types of which are shown, and the Endurance automatic regulator. With regard to the former, by simply screwing back the milled nut the bent nozzle head can be removed and all essential parts of the

turnbuckles, steel eyebolts, and metric bolts; control levers (R.A.F. specification) and control wires; steel title pins for yoke ends of turnbuckles; brass water hose clips; thimbles; canopy buttons and eyelets;



Two universal blow-pipes and the automatic regulator used in the Oxy-acetylene welding system of the British Oxygen Co.

blowpipe inspected. It is claimed that with this type of blowpipe back firing of the flame is practically prevented so that periodical cleaning due to sooting up of internal parts is rarely required. The automatic regulator will reduce the high and varying pressure of oxygen from the cylinder to any required low pressure from zero to 40 lbs. per sq. in., the maximum blowpipe pressure required. The adjustable screwed socket is graduated in lbs. per sq. in., and the regulator can be set by this means to any desired constant pressure enabling the usual low pressure gauge to be dispensed with.

Those who are thinking of installing such a system in their works will doubtless find it worth their while to send for a catalogue, which contains much general useful information on the subject.

**British Petroleum Co., 22, FENCHURCH STREET, E.C.**

"FAMILIARITY breeds contempt" may be true in the general run of things but it certainly is not so with regard to "Shell" motor spirit, which is respected more and more by aviators and motorists as time goes on. It would be idle to dwell upon its merits, as they are so well known, and especially in view of the fact that practically every aviation record has been made by the aid of "Shell."

**Brown Bros., Ltd., GREAT EASTERN STREET, LONDON, E.C.**

It would be impossible to enumerate here all the aero accessories supplied by this well-known firm, for it would not be an exaggeration to say that practically any im-

piston rings; twill, canvas and leather upholstery, with studs, banding and pipings; hubs, spokes and nipples for wheel building; accumulators in all types; dashboard lamps for instrument lighting; tumbler switches; lamp holders; indestructible rubber petrol piping; Brooks' B 170 saddles, suitable for armoured car work; sparking plugs; Gnome engine copper and asbestos washers, all sizes supplied to order; canvas water-carrying buckets (2-gallon); fabric brake lining in their well-known "Raybestos"; driving chains; electrical fittings; aluminium sheeting in all sizes and gauges; brass and copper foil, sheet and strip; steel, brass, and copper tubing of all dimensions; union drawn screwing and cutting steel of every dimension, &c.

Besides supplying most of the various aeroplane builders, they are contractors to the R.F.C., R.A.F., R.N.A.S., Central Flying School, &c.

**R. Cattle, 27, WYBERT STREET, STANHOPE STREET, LONDON, N.W.**

BESIDES supplying wood in the "raw" for aircraft, R. Cattle and Co., a firm of over forty years' standing, also specialise in finished parts, such as ribs, spars, struts (hollow or solid), fairings, &c., all of which are machined up to exact size and section to pass Government inspection. They have a very fine wood-working plant—most of which has been designed and constructed by themselves—capable of turning out all kinds of

work with the greatest degree of accuracy. It should also be noted that they carry a very large stock of silver spruce and ash specially suitable for use in the construction of aircraft.

**Cellon, Ltd., BROAD STREET HOUSE, NEW BROAD STREET.**

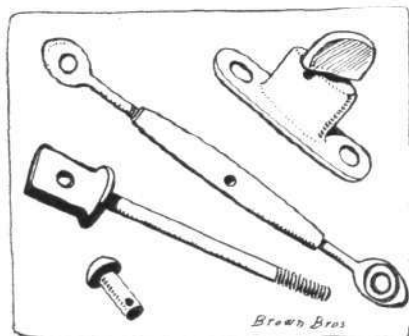
THAT the slogan adopted by this firm with regard to its product, "The dope of proved efficiency," is no idle boast is shown by the fact that the demand for Cellon is continually increasing. Another confirmation is also provided by the fact that several of the leading firms of constructors have arranged for a constant supply of Cellon to be delivered at regular periods. Among the largest users of Cellon are the two British flying services. It is almost unnecessary to add, therefore, that Cellon can be had to comply with the Government requirements as well as other grades to meet special needs.

**T. W. K. Clarke and Co., Ltd., HIGH STREET, HAMPTON WICK.**

MESSRS. T. W. K. CLARKE being now employed mostly on Government work, making acetylene welded and tinned fittings for various machines of R.A.F. design, are not making any special accessories of their own. They have, however, recently established a separate works for propeller making which is now in full going order. Here they are in a position to undertake work for private firms, such as school or experimental propellers, in addition to turning out propellers to standard designs, work in which they have had considerable experience in the past.

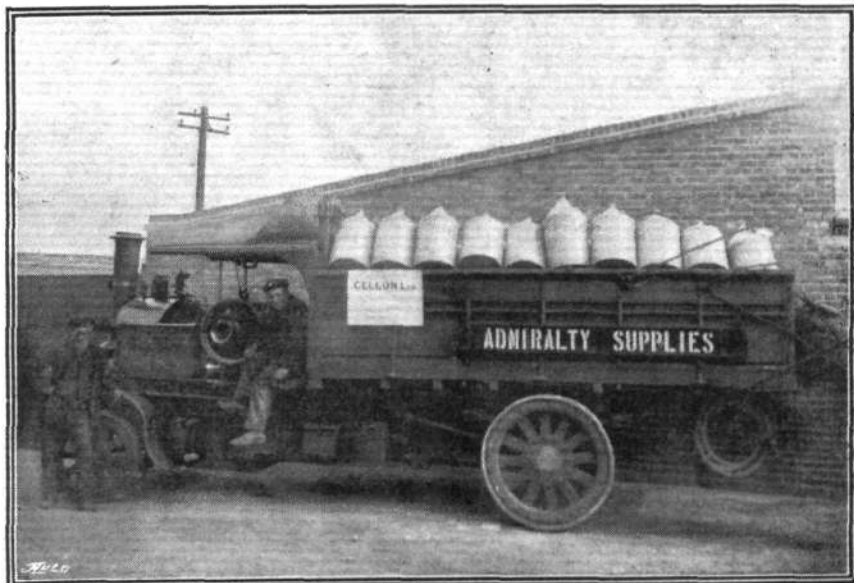
**R. W. Coan, 219C, GOSWELL ROAD, LONDON, E.C.**

IN their own particular sphere there is perhaps no name that is better known throughout the length and breadth of the kingdom than that of Coan, who, as all the world is by this time aware, casts clean crank cases, not to mention innumerable other aluminium objects and parts connected with the automobile and aeronautical industries. It may be said that the work turned out by this firm is in quality and finish unsurpassed, and that no job is either too small or too great for them to undertake. This is equally true of repair work, which indeed forms a large part of their commercial activities, while the latter, moreover, are not by any means confined to the needs of the two industries above mentioned, the requirement of all trades in this respect being catered for.



Some aircraft fittings supplied by Messrs. Brown Brothers.

portant accessory or fitting can be obtained from them, as the following selection will show:—Five-armed (aluminium centres) steering wheels; aeroplane wheels and tyres;



A load of Cellon, being part of an Admiralty contract.



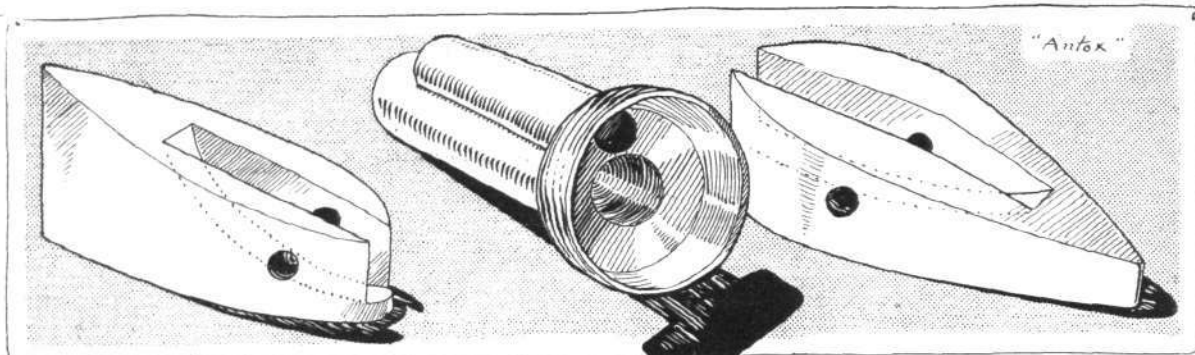
**The Combined Metal and Reinforced Casting Co., Ltd., POINT PLEASANT WORKS, WANDSWORTH, LONDON, S.W.**

IN spite of the very large extensions of their foundry and rolling plant the rapid growth of the business, especially in connec-

thereby helping to retain the extra twist put into the stay when a single-threaded tightening screw is used. In the list of stranded cables suitable for aircraft are included flexible steel wire strands composed of 7, 19, and 37 wires, and with breaking strains

always get the attention it deserves. The Dunlop pressure gauge is an admirable little appliance whereby the motorist can quickly ascertain the pressure of air in each tyre with far greater accuracy than the common method of kicking the tyre with the foot.

Some samples of casting work in Antox by the Combined Metals Co.



tion with Government work, has necessitated still further extensions to the works of this firm. They are now putting down a large machinery plant so that they will be in a position to execute orders for castings in all metal alloys, rolled sheet metal, machinery and polishing of all parts for aircraft and automobiles, such as gear boxes, carburettors, fans, &c. They are the sole manufacturers of "Antox," an aluminium alloy possessing maximum strength combined with minimum weight. "Antox," in the cast state, has a specific gravity of 2.65, and a tensile strength of 12 tons per sq. in., raised to 24 tons for rolled "Antox" and to 30 tons for wire. It also possesses the great advantage over aluminium of not being liable to the ill-effects due to the action of sea-water, &c.

**Geo. Cradock and Co., Ltd., WAKEFIELD.**

THE question of strength in the cross bracing of an aeroplane is one of so great importance that nothing but the very best is good enough for this purpose. Messrs. Cradock and Co. have had long experience in the manufacture of wire rope, being fully equipped for its production from the pig-iron onwards. As the steel is prepared in their own furnaces, the rods rolled, and the wire drawn in their own shops, they are in a position to advise customers as to the most suitable quality and flexibility of rope for the work to be performed. The strands and cords tabulated in the firm's pamphlet, dealing with those most suitable for aviation purposes, are all composed of galvanised or plated steel wire of the highest quality. The stranded cords have a wire main core since a hemp core would absorb and retain moisture, whereas a wire strand in the centre has, of course, no tendency to do this. The core is spun the opposite way to the lay of the rope,

ranging from 390 lbs. to 9,050 lbs., and flexible steel wire cords composed of 49, 133, and 259 wires, and with breaking strains ranging from 1,169 lbs. to 16,345 lbs.

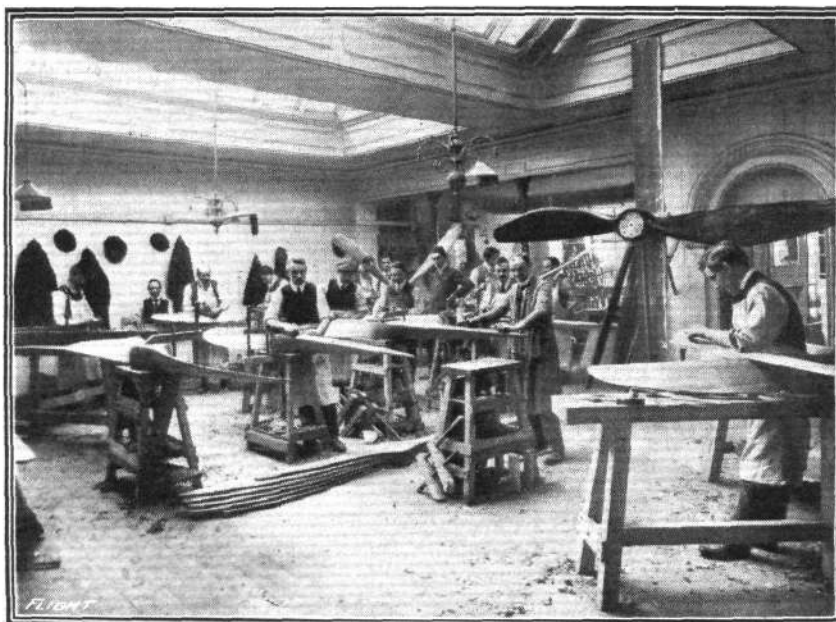
**Dunlop Rubber Co., ASTON CROSS, BIRMINGHAM.**

TYRES for aeroplane wheels, in all the usual sizes, are of course made by the Dunlop

**Ebora Propeller Co., 11 AND 12, SURBITON PARK TERRACE, KINGSTON-ON-THAMES.**

AMONGST the aircraft firms that have rapidly gained a reputation for accurate and highly finished work is the Ebora Company.

Started only half a year ago on a small scale, they soon found their works too small



One of the shops of the Ebora Propeller Co.

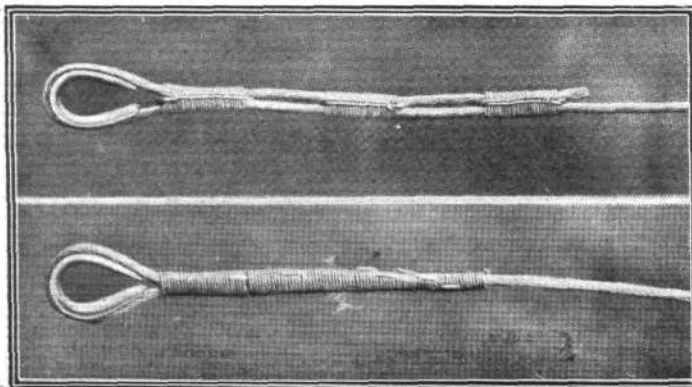
Co., who in addition market several accessories which make for economy in the use of aeroplane tyres, a matter which does not

and had to look for better accommodation, which they found as above, where they now have established the different departments into which a modern propeller works is divided. At present they are extremely busy with four-bladed and two-bladed propellers of standard designs, as well as a number of experimental propellers of a new and highly interesting construction.

In addition, propellers are built on a design evolved by the managing director, Mr. Jan Schiere, A.F.Ae.S., based on experiments made in the works and aerodynamical laboratories abroad. This type of propeller, to which the name Ebora has been given, has now been built for various types of engines up to 200 h.p.

For flying schools, where extreme lightness is an important factor, a special model of propeller has been constructed, and has proved a success.

Two methods of securing the ends of Cradock steel wire strands.



# HARRODS LEATHER CLOTHING

FOR

## AVIATORS

MOTORING & MILITARY USE

The approved Naval Aviator's Chrome Leather Overcoat, lined warm Fleece throughout, in Black £4 19 6  
Ditto, in Tan - - - £6 10 0  
Black Leather Jacket, lined Flannel £2 15 0

The approved Aviator's Suit in Black Chrome Leather, lined Fleece throughout - - - 8 Gns.  
Ditto, in Tan - - - 9 Gns.  
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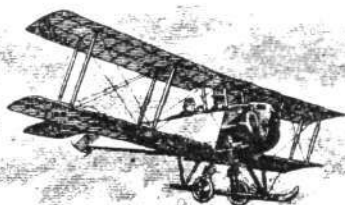
RICHARD BURBIDGE, Managing Director.

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(Proprietor—G. H. MANSFIELD)



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**Electric Battery Co., 62, EAGLE STREET, HOLBORN, E.C.**

A MODIFIED form of the well-known E.B.C. car lighting dynamo has recently

the timber trade and who, through their business connections, are in a position to ensure that their goods are grown under the most suitable climatic conditions, and, after

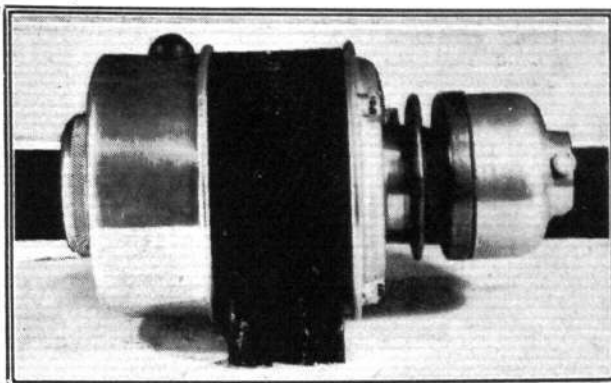
becomes one of some importance, and for that reason alone the sheds produced by this firm will be well worth investigating, apart from any interest attaching to the buildings themselves. A further inducement to get into communication with this firm is that they include in their contracts a heavy penalty for each day the completion is overdue, so that aircraft manufacturers may always rely upon getting buildings finished on time when ordering them from the Fairby Construction Company.

**The General Aeronautical Co., Ltd., 30, REGENT STREET, S.W.**

IN their new works at Hythe Road, Willesden Junction, which are now in full going order, the General Aeronautical Co., Ltd., have ample facilities for meeting the steadily increasing demand for their British made specialities. An extensive equipment of up-to-date machinery and machine tools have been laid down.

One branch of the business which is being rapidly developed is that devoted to the production of G.A.C. propellers, the firm having acquired the manufacturing rights for Great Britain of the Regy propellers, which have met with very great success in France. With the new facilities which they now have available the firm are specialising in the making of propellers to Government designs

General view of the new light-weight E. B. C. dynamo, specially designed for use on aeroplanes.



been introduced, which is particularly adapted for use on aeroplanes, where its services in conjunction with a projector should be of inestimable value in night flying, as also for the illumination of the instrument board in front of the pilot, while another sphere of utility for such a machine is of course in connection with wireless work.

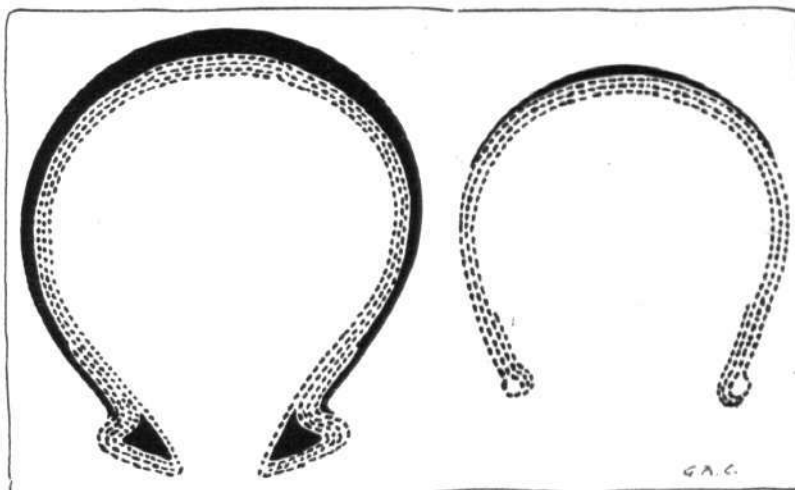
The great feature of the machine is its light weight, being but 10 lbs. complete. This practically is the total weight of the whole plant necessary, except that of the lamps themselves, since the machine is intended to supply the current direct without accumulators. The question at once arises, however, as to whether, in view of the last statement, the projector would be of much utility when landing, since the engine would then probably be well throttled down and the light proportionately decreased in intensity. We are assured, however, that so long as the engine is running, whether driven by its own power or by air pressure on the propeller, the light is not appreciably less than when the engine is running at normal speeds, while for speeds above normal, of course, the automatic regulation of the voltage, inherent from the design of the machine, provides that the lamp filaments do not suffer from overloading.

The extreme lightness of the dynamo is the outcome of clever design in the employment of metal to its best purpose and by the use of aluminium for all those parts of the machine that may be described as being of a constructional rather than effective nature.

**The Engineering Timber Co., Ltd., 9, VICTORIA STREET, S.W.**

A SUDDEN increase in the demand for wood always carries with it the danger of a falling off in quality, and the best safeguard against this is to deal with firms who have had experience in the various branches of

cutting, have not been partly spoilt by having the drying process accelerated in the dry kiln. The Engineering Timber Co. hold large quantities of all the various sorts of wood used in the manufacture of aeroplanes, such as clear silver spruce in long lengths, West Virginia spruce and English ash, while they also have on hand a good stock of mahogany and walnut suitable for propeller making.



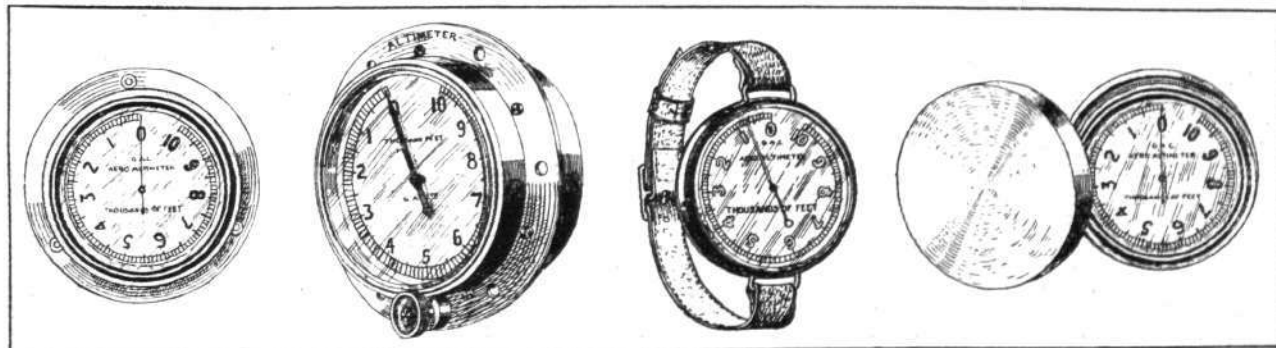
G.A.C. Aero Tyres.—That on the left is the beaded edge pattern, while the wired-on model to the right is the standard for Farman machines, &c.

**The Fairby Construction Co., Ltd., LONGFIELD, KENT.**

THIS firm are designers and makers of steel construction factory buildings suitable for aircraft works, and of aeroplane sheds, the latter incorporating a new idea in doors. As aeroplanes grow in size, the question of suitable doors that can be easily opened

and other air-screws for Government machines. It need hardly be said in this connection that only the best materials are employed and every care taken to ensure that the workmanship is of the highest grade.

Readers of "FLIGHT" are already familiar with the various styles of G.A.C. feather-



Some styles of the G.A.C. featherweight altimeters.

weight altimeters, which have acquired great popularity on account of their qualities of accuracy and lightness. The range of instruments practically covers every conceivable requirement, and the sketches show but one or two which are in the greatest demand. They are sold in several styles—for screwing on to the dashboard, for wearing on the wrist, and for carrying in the pocket or in a leather sling case, the last-mentioned being specially suitable for observers. All of them are distinguished by their lightness, the cases being made of aluminium, and in most styles they can be had with the figures treated with luminous radium, so as to be readable at night. One model, known as the standard aeroplane model, is made to the Government Mark IVA specification, and it can be had either with the usual white dial and with black figures, or a black dial with white luminous figures; the advantage of this is that it is clearly readable by day or night, and it has the advantage for day that it prevents any reflection of the sun's rays. Another instrument which is finding a good deal of favour with flying officers and others is a combined watch and compass for wearing on the wrist. The compass is mounted in the cover of the watch, and both the dial of the compass and that of the watch, together with the pointer and hands, are treated with luminous radium.

Flying officers and those who wish to make a present to a friend in the flying service will also be interested in the G.A.C. goggles, which are beautifully made to comfortably fit the face, the edges being lined with best quality plush while the eyepieces are made of Triplex glass, thus avoiding the danger of splintered glass in case of an accident.

The demand for G.A.C. aero wheels continues to be greater than ever, and an extensive plant has been installed at the new works for the building of them in greatly increased quantities. One of the standard 24 ins. by 3 ins. wheels was recently subjected to breaking strains, and was found to withstand a load of 3 tons before the spokes began to give. G.A.C. tyres, which are specially manufactured by Messrs. Spencer, Moulton & Co., of London and Bradford, can be obtained in all the usual sizes either in the beaded edge or wired-on patterns, the latter being standard on all Farman machines. G.A.C. inner tubes are made in two thicknesses, light and heavy, and strength for gauge are guaranteed unbeatable.

Our readers may be interested to learn that the G.A.C. can offer early deliveries of B.E. strainers.

On account of the congested state of the carriers at the present time the firm have found it necessary, in order to meet the pressing demands from some of their clients, to convert their Chenard-Walcker touring car into a lorry and it is rendering yeoman service, having already a good many thousands of miles to its credit and with some very good loads too.

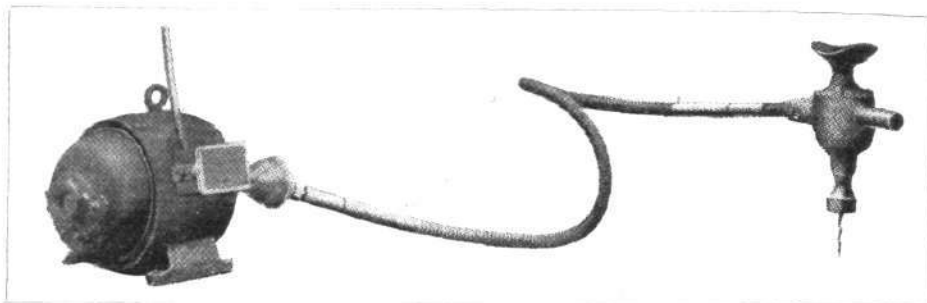
**The General Electric Co., Ltd. 67, QUEEN VICTORIA STREET, E.C.**

WITH their long experience, the General Electric Co. are in a position to carry out the complete electrification, electric lighting, and steam heating of factories of all descriptions. Different kinds of drive are desirable in different cases, though in a great many cases individual drive, i.e., a special electric motor for each machine tool, is desirable on account of the niceties of control possible and the economy of running, as the motor is only working when the tool is in use. In some cases, however, it is better to adopt group driving, i.e., to run machines from

short lengths of shafting driven by electric motors.

The switchgear necessary for the control of electric power in factories must be of special construction to withstand the rough usage generally meted out to such gear, and certain rules and regulations issued by the Home Office have to be followed. The G.E.C. has specialised in this work, and can

General Electric Co. supply combined steam heaters and electric propeller fans, two types being furnished, one low pressure and one high pressure. Both have a capacity of 2,600 cub. ft. of air per min. raised through 60° F. The General Electric Co. also make a speciality of ventilating installations, particularly for shops where doping is carried on.



Two examples of G.E.C. electric power installations.—Above, an individual motor driving a breast drill; below, a Witton motor driving a band saw, saw-sharpener, grinder, and spindle machine.

deal with any case which may arise whether it be for motor starters and controllers, main switches, sub-switches for lighting or power, circuit breakers and fuses, &c., as well as for complete equipments. Mention should be made of the bench drills, breast drills, grinders, &c., supplied by the G.E.C.

The adequate lighting of factories is a matter of great importance, and here the skilled assistance of the G.E.C. Illuminating Engineering Department will be found of service—this department having been formed some years ago to take up scientifically the question of lighting in all its aspects. No hard and fast rule can be drawn up, but the G.E.C. "Dalite" system can be adapted to any case, as direct, indirect, and semi-indirect lighting units are used according to circumstances, special units for factory use being available. The lamps used are Osram drawn wire lamps or Osram Atmos type lamps. These lamps are made at the Osram-Robertson Lamp Works, Hammersmith, London. Where small candlepower units are required Osram drawn wire lamps are considered to be the best, but where larger units are desirable Osram Atmos type lamps will be found to meet all requirements—a white light approximating to daylight being obtained.

For purposes of factory heating, the

**J. Gliksten and Son, Ltd., CARPENTERS ROAD, STRATFORD, LONDON, E.**

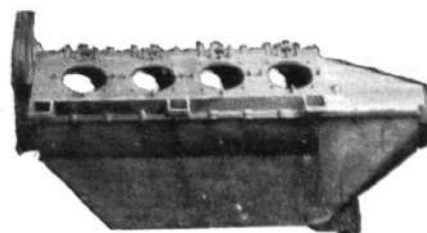
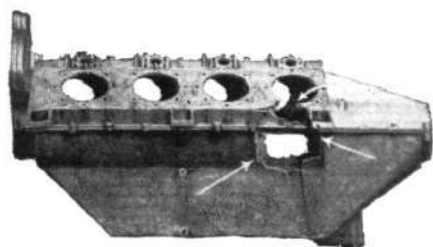
WITH a view to meeting the varied needs of aircraft manufacturers this firm hold extensive stocks of the woods mostly used in the manufacture of aeroplanes and propellers, including silver spruce, mahogany and walnut.

**William Gschwind and Co., 211, DEANS GATE, MANCHESTER.**

THIS firm, who are contractors to the British, French and Russian governments, make a speciality of high grade fine cotton fabrics suitable for the envelopes of balloons and airships as well as for the wing covering of aeroplanes.

**The Hasler Telegraph Works, 26, VICTORIA STREET, WESTMINSTER, LONDON, S.W.**

THE "Tel" aero-engine-revolution indicators which are now very extensively used by practically all the Allied Governments, are constructed on the same principle as the speed indicators and recorders made by the Hasler Telegraph Works for many years past, specially for use on locomotives, tramcars, and automobiles. These instruments have a mechanical action which differs entirely from the centrifugal or magnetic systems. The primary feature of the "Tel"



## Barimar Triumphs in Aeroplane Repair Work

A long series of intricate and highly technical aeroplane repairs accepted under the famous Barimar Guarantee has won for the Service enthusiastic approval on every hand.

*The job illustrated is the repair of an aluminium crank-case from the 8 cyl. engine of a Curtiss Biplane, belonging to the well-known aviator Capt. Bass. The case was fractured on both sides of the bottom and one side of the top half, the break involving the cylinder base orifice. Perfectly repaired without the slightest distortion or trace of repair, the casing was delivered machined, faced up and all ready to refit. Some six months later the unit after giving every satisfaction was damaged in a fresh place and was returned for further*

*treatment. The second repair is as completely effective as the first. Both jobs were done under Guarantee terms to make a perfect repair or refund every penny paid.*

Promptness is a feature of Barimar Service and moderate prices always obtain.

Send a trial job to-day—any damaged part of any aeroplane engine or metal gear of any kind. Send carriage paid direct to

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EYE BOLTS & EYE NUTS  
U-BOLTS  
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WIRE IN ALL GAUGES

ENQUIRIES SOLICITED AND PROMPT NOTIFICATION GIVEN AS TO ABILITY TO EXECUTE.

When communicating with advertisers, mention of "Flight" will ensure special attention.



**FAIRBY CONSTRUCTION CO.,  
LTD.,****117, VICTORIA STREET, S.W.****THERE IS NO CHANCE**

of our finishing the "special" factory by the 23rd November and for a very good reason—a supplementary contract is about to be signed for a large addition to the original plan—and further buildings are in contemplation here but

**WE DO NOT MIND REPEAT  
ORDERS.**

Last week we were asked to delete our penalty and bonus clause—from a contract with a well known firm. They knew we were not afraid of a penalty of £30 a day and they did not want to pay us a bonus at such a rate.

**WE MUST THEREFORE HAVE  
BUILT UP A REPUTATION**

even in the comparatively short time we have been running. We do not profess to be an old firm—we specialise in the new methods for the new conditions the War has brought about.

**TELEPHONE : 8868 VICTORIA.****SPERRY  
Gyroscopic  
Stabilizer**

in use on Machines of the British,  
Russian, and Italian Governments.

It incorporates a horizontal reference plane of accuracy and integrity to which all angles can be referred.

It is a reliable mechanical pilot of never-failing accuracy, capable of correcting disturbances at their inception.

Its use permits the selection of an aeroplane with the highest efficiency in speed and climbing capacity without regard to other factors.

It relieves the pilot of nervous and physical fatigue incident to flying, allowing him to make those observations for which an observer has hitherto been required.

Unlike the pilot, its efficiency is unaffected by fog or darkness.

For these reasons it is the logical accessory to every military aeroplane.



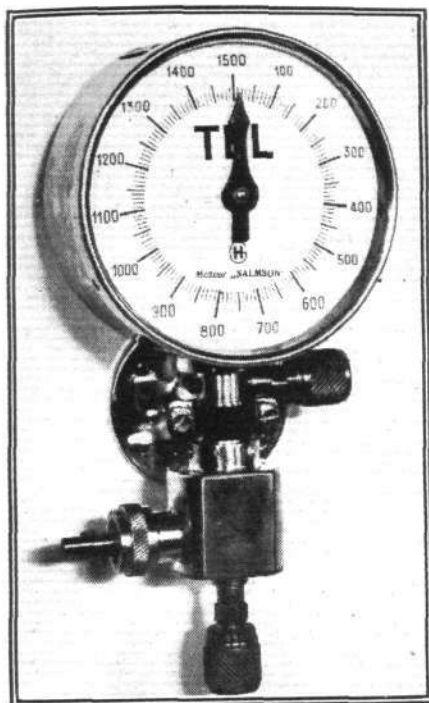
**THE SPERRY GYROSCOPE  
COMPANY, LTD.,**

15, Victoria Street, London,  
S.W.

Telephone—

Victoria 7398

indicator is that the indicating needle is reset by the mechanism every second so that every variation of speed is indicated accordingly. There are several models manufactured, differing only in detail fittings, according to



One of the Tel revolution indicators made by the Hasler Telegraph Works.

the type of engine, but all the same as regards mechanism. The calibrations are also varied to suit different conditions. Another Hasler instrument, which appeals more to manufacturers, is the "portable" revolution, circumference and cutting speeds indicator by means of which the number of r.p.m. of a revolving shaft, &c., is shown in three seconds without the aid of a watch.

**Messrs. Wm. Heaton and Son, Ltd.,**  
LOSTOCK JUNCTION MILLS, LOSTOCK,  
NEAR BOLTON.

ONE example of the far-reaching demands of aircraft is shown by the fact that the yarns of which the fabric is made are now being specially spun in Lancashire. One of the first firms quick to grasp the possibilities in this direction was Messrs. Wm. Heaton and Sons, Ltd., who brought their 115 years' experience to bear in specialising in spinning superfine combed "Sea Island" yarns for such purposes, and official tests which have been conducted with the yarns have given splendid results at regards strength and elasticity. Aircraft fabric woven from these special yarns is used for the inner and outer coverings of airship envelopes, coverings for seaplanes, and it is also now being adopted in place of linen for aeroplane work. At their mills at Lostock and Doffcocker, near Bolton, the firm now operate 263,000 spindles, and the counts spun in the mills range from 50's up to 300's twist and weft. The yarns have been subjected to the severest official tests, and have proved to have the maximum amount of strength with elasticity.

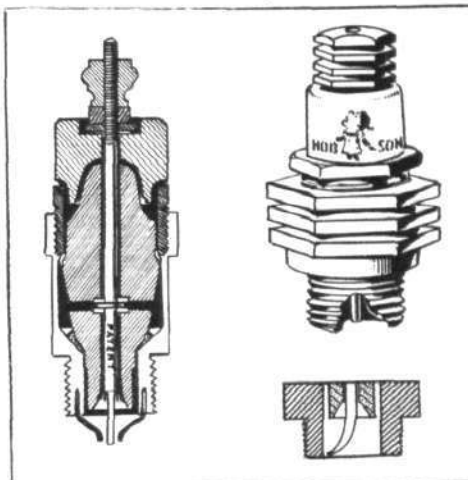
**Hewlett and Blondeau, OMNIA WORKS,**  
LEAGRAVE, BEDS.

APART from the building of aeroplanes, Messrs. Hewlett and Blondeau make a speciality of supplying the necessary fittings, for which purpose they have put down an extensive plant at their new works. The

quality of their work is shown by the fact that it is impossible to keep pace with the demand, especially for strainers and bolts to Government specifications. They keep a fair stock of washers, ferrules, steel and brass thimbles, both of H. and B. designs and to R.A.F. specifications.

**H. M. Hobson, Ltd., 29, VAUXHALL**  
BRIDGE ROAD, LONDON, S.W.

SEVERAL types of plugs suitable for use on aero engines under various conditions are produced by Messrs. H. M. Hobson, and the fact that these plugs are used almost extensively for certain particular types of aero engines by the British, French, Italian, and other Governments, is sufficient proof of their reliability. The main feature of the standard Hobson plug is that the insulator (porcelain) is in three sections, and the electrode is entirely separate from the insulator. The various parts are thus able



Various styles of Hobson plugs for aero engines, that on the right being for rotary motors.

to expand and contract independently of each other. This construction is shown in the accompanying sketch. The different types of Hobson plugs are as follows: 14 Ae. single-gap electrodes, 14 B double-gap suitable for Salmson engines, 14 I.P. single-gap "skirted" suitable for hot and high compression engines. 13 small size, two porcelain insulators suitable for Green and water-cooled engines. There are also two plugs designed for rotary engines, one having cooling fins formed on the body, and another plug with a mica-porcelain insulation capable of withstanding much rough usage. Another Hobson line consists of insulated and watertight "push on" terminals.

**The "Integral" Propeller Co., Ltd.,**  
1B, ELTHORNE ROAD, UPPER HOLLOWAY.

JUSTLY famous for the fact that they have been fitted to so many of the machines

manship and accuracy of design, and it is not surprising therefore that they are so extensively used on British naval and military machines. Not only are they made of the best selected wood, but special attention is paid to the grain of the wood, which runs straight from one tip of the propeller to the other. In addition, by the use of special testing machines, every care is taken to ensure that Integral propellers are perfectly balanced so as to eliminate any possibility of vibration, that is so detrimental to the running of the engine. Apart from the propellers for land machines, the firm makes special propellers for seaplanes, with the tips protected against damage from flying spray by means of brass sheaths securely riveted. For use on dirigible airships a special propeller is produced in which the pitch can be varied during flight.

In order to cope with the ever-increasing demand for Integral propellers new premises have been acquired at Hendon, equipped with the most up-to-date machinery for propeller manufacture. As a large stock of Integral propellers of all sizes and pitches is kept on hand delivery can generally be made at shortest possible notice.

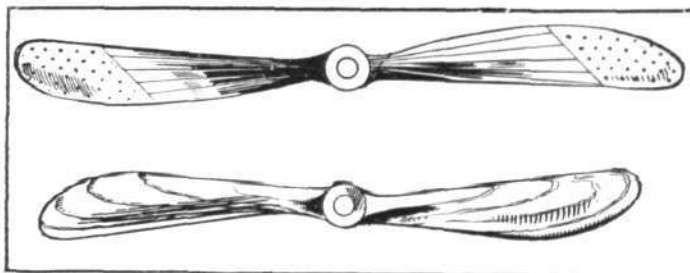
At their extensive works in Paris the company are able to undertake to manufacture and give deliveries of all types of metal bosses for aero motors, a branch of the business which is now being rapidly developed.

**The Improved Liquid Glues Co., Ltd.,**  
GREAT HERMITAGE STREET, LONDON,  
E.C.

OUR readers are already familiar with "Croid" glue which is advocated as most suitable for use in connection with aircraft. "Croid" is a liquid cold glue, and although it only requires the addition of cold water to be ready for use it is claimed to possess great strength and lasting properties, and has certainly given excellent results under test. A 9-in. length of teak 2 ins. square glued with "Croid" end grain to another piece carried a suspended weight of 282 lbs. before the joint gave, which is equivalent to a breaking strain of  $5\frac{1}{2}$  cwt. per sq. in. This glue is specially recommended for use in connection with propellers. The advantage is that it does not "chill" in cold weather and it will not stain the fingers. It is obtainable in convenient form, either in  $\frac{1}{4}$  lb. to 1 cwt. tins or in tubes (small 1d., large 6d.).

**Kelvin, Bottomley, and Baird, Ltd.,**  
16-20, CAMBRIDGE STREET, GLASGOW.

THIS firm's specialities consist of the Lord Kelvin (Sir William Thomson) navigational and electrical instruments, including compasses specially designed for aircraft. These latter instruments are of various types, standard Admiralty and War Office pattern, and ordinary models. That shown on the right of our illustration is the standard airship compass. The case, hood, and mounts



Two Integral propellers, that at the top being for seaplane work.

which have established world's records, Integral (Chauvière) propellers have won a much more lasting reputation for good work-

are all made of aluminium finished dull matt black, and the windows are made of celluloid. The bowl is fitted with a special shock-

absorbing device registered lubber screw, which is also shown in magnified image. The lighting for night work is provided for by an electric lamp in the hood. The other in-

**The Lodge Sparking Plug Co., Ltd.,**  
WRENTHAM STREET, BIRMINGHAM.

HAVING made a name for their sparking plugs for automobiles, it is not surprising

to be produced. One of such that has been manufactured by the Lodge Co. has withstood most trying and exacting tests working under long continuous full load conditions. The insulation is of mica, and the body of the plug has large cooling fins formed on it.

**W. Lester, 10, HAM YARD, SHAFTESBURY AVENUE, W.C.**

CAN give quick delivery of all fittings, undertakes metal press work, metal stamping, metal jig sawing, and can furnish blanks of any size and thickness.

**The London Label Co., Ltd.,** BECTON ROAD, PLAISTOW, LONDON, E.

AMONGST the various specialities, applicable to aircraft, manufactured by the above firm, some of which are illustrated by the accompanying sketches, are all kinds of labels for instrument boards, dials for compasses, transparent wind shields and map-covers, and goggles. The latter are strongly made of best red rubber, and are reinforced in all the places where breakage is likely to occur. The eye-pieces are made of Non-Flam transparent celluloid, which are not only fire proof but are unaffected by oil and petrol. It is claimed that they will not crack or splinter, and will always retain their transparency. The wind shield, illustrated, is made of the same material, and is cut exactly to R.A.F. specifications for B.E. 2c machines. The map covers are also of Non-Flam celluloid, 1 mm. thick, having lines, in red, accurately cut into the material forming 1 in. square. The name and address plates, title and instruction labels for the various instruments on the dash boards can be made in metal, ivory, celluloid, bonite, &c.

**Mappin and Webb, Ltd.,** REGENT STREET, W.

THIS well-known firm of silversmiths have by no means neglected the aviator, for amongst their comprehensive range of watches, clocks, &c., will be found several that will meet their requirements. One of these, a wrist watch, is shown in the accom-



An observer's compass for wearing on wrist or knee, and the standard airship compass made by Kelvin, Bottomley, and Baird, Ltd.

strument illustrated is an observer's compass, which is worn on the wrist or knee, and is illuminated by a small electric bulb embodied in the compass case, the battery being of the pocket type. The standard aeroplane compass has a hood with sliding doors, and a course indicator mounted on the rim of case inside. The case, hood, and mounts are made of brass finished dull, and provision is made for lighting the compass by means of a dry cell mounted outside the compass case.

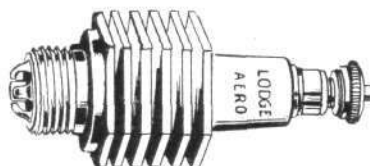
**Kroll and Co.,** BAYHAM PLACE, CAMDEN TOWN, LONDON, N.W.

MESSRS. KROLL AND CO., who are well known in the automobile world in connection with sheet metal work, have recently opened out in the production of metal fittings and parts for aircraft. With their previous extensive experience in metal work behind them, they have been able to build up a position to undertake all kinds of metal work for aircraft, ensuring large and speedy production with the greatest possible degree of accuracy.

**Lang Propeller, Ltd.,** WEYBRIDGE, SURREY.

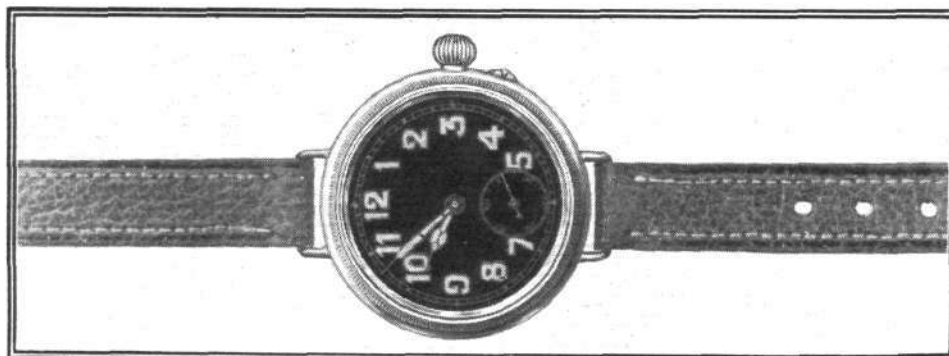
MAKERS of the well-known Lang propellers that have been used with such great success by a number of leading aviators during the last three years, this firm has a large stock of Lang propellers, which are invariably of the very best workmanship and well designed. Special types for experimental machines can be delivered at a few days' notice, and they are at all times willing to lend their aid to builders in finding a suitable propeller for a new machine.

that the Lodge Sparking Plug Co., Ltd., have been equally successful with sparking



A Lodge sparking plug for aero engines.

plugs for aero engines. Although under certain circumstances the ordinary sparking

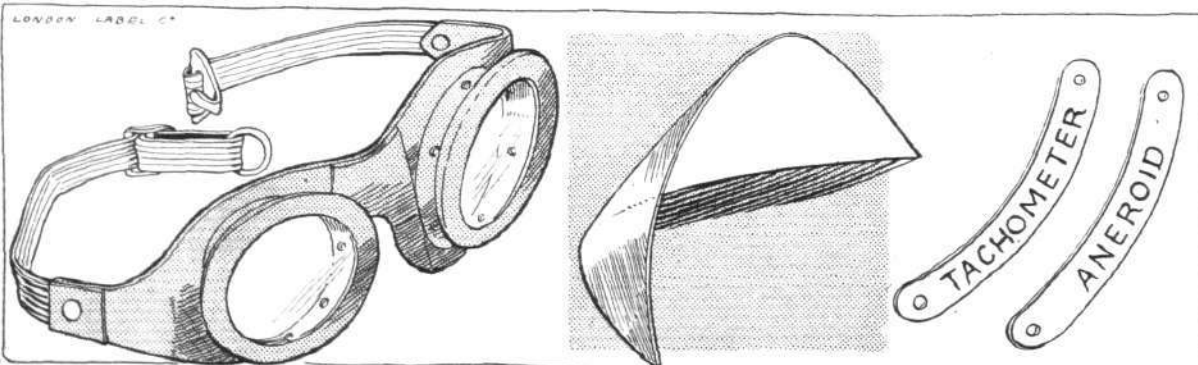


A wrist watch with luminous figures, a speciality of Messrs. Mappin and Webb.

plug may be used for aero engines, there are conditions under which the ordinary plug cannot hold out, and so a special pattern has

panying illustration. This watch has a solid silver case with screw bezel. The dial is black with bold, luminous figures, enabling

The goggles, windshield, and instrument labels are made from Non-flam. sheets by the London Label Co.





the time to be read with the greatest ease, either by day or night. The price of this useful article, which makes a very acceptable present, is £3.

**Wm. Mallinson and Sons, Ltd.,** 130 TO 138, HACKNEY ROAD.

THESE well-known timber and veneer merchants and importers of American hardwoods hold large stocks of all the usual woods used in aeroplane construction, and their high standing is sufficient guarantee that timbers bought from them will be of the best quality and well-seasoned. In addition to the ordinary woods, this firm make a speciality of plywood, for the making of which they have a large factory at Laburnum Street, Kingsland Road. Here they make up, among other styles, the waterproof plywood asked for in the R.A.F. specifications, a branch of the business which is assuming large proportions.

**Marsh Brothers, POND STEEL WORKS,** SHEFFIELD.

SUPPLY steel tension wire of all gauges and strengths, suitable for aeroplanes, gliders and other aircraft. In addition they keep in stock all kinds of engineers' tool steel, twist drills, hack saw blades, &c.

**Menday Motor Components Co., Ltd.,** CROWN WORKS, GATTON ROAD, UPPER Tooting Road, S.W.

THIS firm of general engineers make a speciality of metal propeller bosses for every make of engine.

**The Mears Ear Phone Co. (London), Ltd.,** 193, REGENT STREET, W.

THE advantage of a method by which the pilot of an aeroplane is enabled to carry on conversation with his passenger in a more convenient and comprehensive manner than by means of the somewhat primitive system of deaf and dumb signalling which usually has to suffice, is too obvious to need enlarging upon. Owing to the (in most cases) deafening roar of a high-powered engine telephonic communication between pilot and passenger offers considerable difficulties, but that these may be overcome has been demonstrated by Mr. L. G. Hammer, of the Mears Ear Phone Co., whose "Aerophone" appears to make such conversation possible.

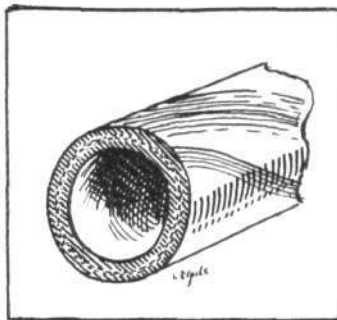
This apparatus consists of two microphone transmitters and two receivers, one set being worn by the pilot and the other by the

passenger. The receivers are provided with a switch by means of which the volume of sound may be regulated to four or eight different degrees of strength according to individual ability of hearing and the noise made by the engine. Attached to the framework of the aeroplane are two sockets adapted to receive corresponding plugs. These sockets are connected by an insulated wire, and also to the battery furnishing the necessary current. The terminals of the plugs are connected by similar wires to the two sets of transmitters and receivers.

In order to exclude external noise the bell-shaped mouthpiece of the transmitter is provided, where it comes in contact with the wearer's face, with a pneumatic cushion which further serves to protect the wearer in case of accident. The whole outfit is very light, and can be quickly mounted on any machine.

**Mestre and Blatge, 20, STONE STREET,** TOTTENHAM COURT ROAD, W.C.

THE question of a suitable flexible connection for petrol leads on an aeroplane is one of considerable importance and a problem not readily solved. Owing to its extensive employment for other purposes rubber tubing was one of the first to be tried, but it was



A sample of L'Etoile tubing.

soon found that petrol had a highly detrimental effect on the rubber. The makers of the original petrol resisting rubber tubing L'Etoile have constantly improved their product, which is now recognized to be in the very front rank. Messrs. Mestre and Blatge, who are the sole agents in this country for L'Etoile, hold a very large stock

it for nearly 300 hours continuously. A sample of ordinary rubber tubing similarly tested was found to be gelatinated after only about nine hours. Although L'Etoile tubing is of French manufacture its application to unions of British sizes presents no difficulties, since, when ordering stating the size of the union, the nearest smaller metric size is supplied, giving just the right tight fit. The accompanying sketch will give some idea of the construction of this tubing, which is made up of two layers of specially-treated rubber, between which is a layer of cotton fabric.

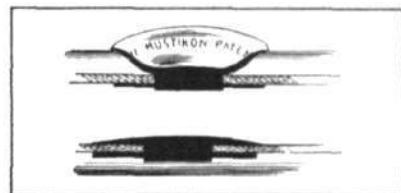
Messrs. Mestre and Blatge also sell an aluminium solder which has proved very successful.

**Motor Radiators, Ltd., 80, FAROE ROAD,** BLYTHE ROAD, HAMMERSMITH.

WITH the increase in size of aeroplanes and aeroplane engines has come the more extensive use of water-cooled motors. The question of a suitable radiator therefore becomes one of importance, and the requirements of aero radiators are naturally somewhat different from those obtaining in motor car practice. Thus the question of weight and head resistance for a given cooling surface has to be given every attention. Motor Radiators, Ltd. are the makers of light aeroplane radiators for all the various types of water-cooled engines in use, and aeroplane constructors who are beginning to fit this type would do well to communicate with this firm.

**Mustikon, Ltd., 20, NEW STREET,** CARDIFF.

PROGRESS in the art of repairing tyres still goes on, and whereas a few years ago it was thought that the vulcanising plant was the only repair agency for punctures and bursts, several ingenious devices have been produced to meet the demand for a quicker method of repair. The latest development in this direction is known as the Mustikon, and its method of application is clearly shown in the sketches. In the case of a puncture, a round hole is made with the special cutting tool, the Mustikon rubber stud is inserted and the two surfaces are

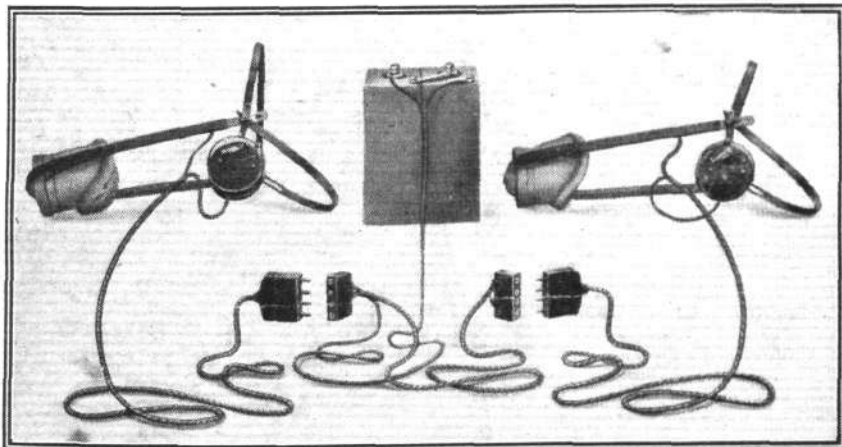


The Mustikon Tyre-repairing Device.—Above, the rubber stud inserted; below, the repair completed.

pinched together after being solutioned, thus effectively sealing the perforation. Of course, it is necessary to clean the rubber in the region of the patch just in the same way as when putting a patch on in the ordinary way. A special point in favour of the Mustikon method is that the stud patch being all rubber is capable of stretching with the tube. Moreover, being moulded from one piece of rubber, there is no tendency for the two main portions of the patch or the stem to separate from one another. The Mustikon repair outfits include the necessary tools, a supply of rubber studs, solution and french chalk.

**Bernard Nicklin and Co., CROSS STREET** AND UNION STREET, SMETHWICK.

This firm of iron, steel and general merchants are catering specially for the aeronautic industry and are stocking specially prepared steel sheets to meet the requirements of the Royal Aircraft Factory's Specification No. 9a. These sheets are kept in stock in all the required gauges and sizes, and



The Mears aerophone set complete.

passenger. The transmitters and receivers are held to the mouth and ear respectively by adjustable steel bands. The transmitter of the pilot's set is connected in series with the receiver of the passenger's set and vice

versa. The receivers are provided with a switch by means of which the volume of sound may be regulated to four or eight different degrees of strength according to individual ability of hearing and the noise made by the engine.

A sample of this tubing was officially tested some time ago, and was found to withstand the effects of petrol passing through

in most cases can be despatched promptly, a fact which has proved a means of great assistance to several aeroplane manufacturers recently. We also understand that these sheets are also supplied direct to the Royal Aircraft Factory at Farnborough.

**Maschinenfabrik Oerlikon (Switzerland),**  
OSWALDESTRE HOUSE, NORFOLK  
STREET, STRAND, LONDON, W.C.

THE production of hydrogen and oxygen forms a by no means unimportant item in

likon electrolyser plants are now in use, not only in the aeronautical industry but in others, such as metallic filament lamp factories, oil refineries, &c., and a large installation is in use at the Royal Aircraft Factory at Farnborough. This system is specially recommended in cases where an already existing source of power, which is not working at its full capacity, is available for the working of the electrolyser. A very complete plant for welding, &c., can be

put being in proportion to the gas consumption.

**Omnium Central, 175, SHAFTESBURY AVENUE, LONDON, W.C.**

THIS firm possess facilities for the manufacture of all classes of highest grade engineering work for aeroplane engines, particularly of the rotary type, as well as the provision of spare parts, &c. They are also agents for best quality French propellers, tachimeters, and other fittings and accessories.

**Opel Motors, Ltd., HALKIN STREET, HYDE PARK, S.W.**

HAVE ample facilities for the complete overhaul of aircraft engines of all types and sizes, a work in which they have already made a splendid name for themselves. A staff of expert mechanics are continually engaged on work of this character, and the engines which have passed through their hands have ranged from 35 to 300 h.p.

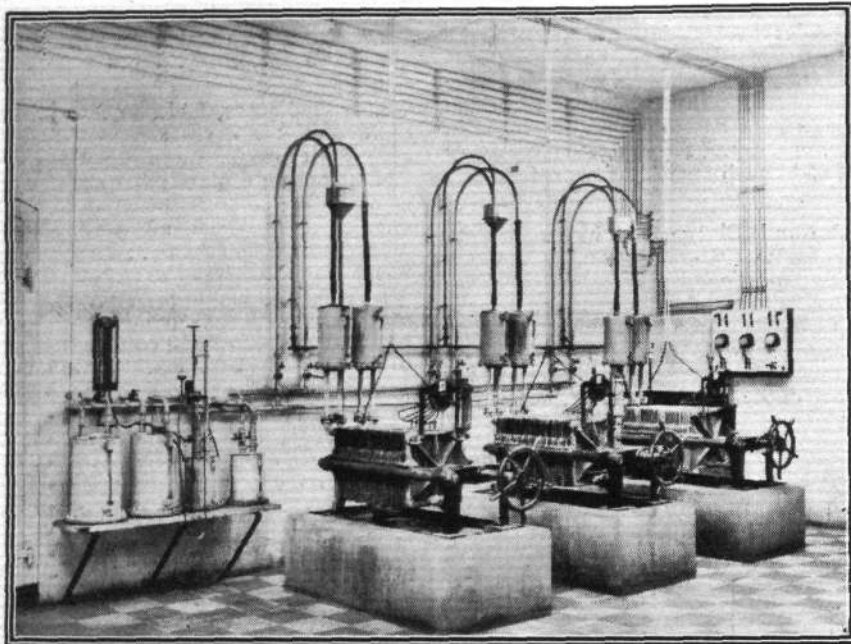
**Joseph Owen and Sons, Ltd., TIMBER MERCHANTS, BOROUGH SAWMILLS, 199A, BOROUGH HIGH STREET, S.E.**

THIS firm are the importers of clear silver spruce suitable for aeroplane and sea-plane work, and number amongst their customers the leading builders in the country, as well as the Royal Aircraft Factory at Farnborough. They also hold good stocks of mahogany and walnut specially selected for propellers, and make a speciality of clean, straight English ash; also poplar, three-ply, &c.

In passing, it is of interest to note that their London yard is on the site of the Old Marshalsea Prison, and is visited by large numbers of American and other tourists interested in the works of Dickens.

**Palmer Tyre, Ltd., SHAFTESBURY AVENUE, W.C.**

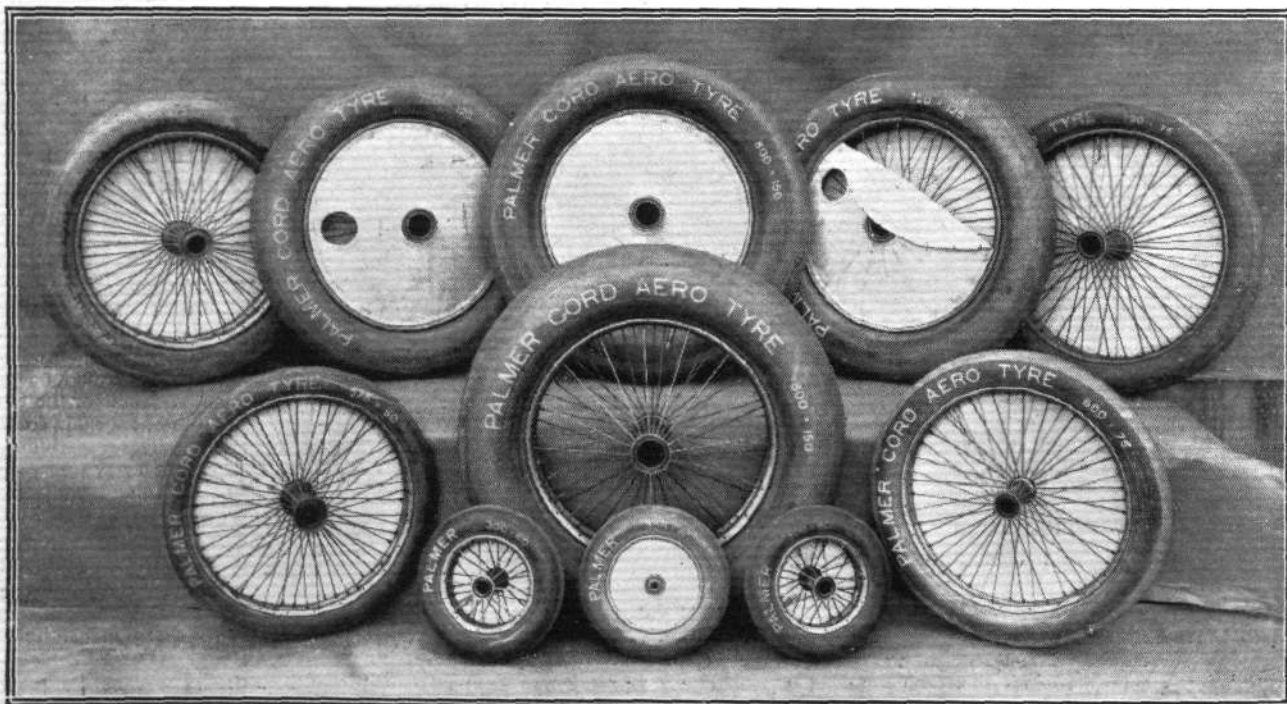
ONE of the first firms which realised the arduous conditions under which aeroplane wheels and tyres have to work, Messrs. Palmer Tyre Ltd., by long-continued experiments and tests, have produced a special wheel and tyre which have given extraordinary results. They have also laid themselves out to meet the greatly-increased demand for these wheels and tyres, which can



A complete Oerlikon hydrogen and oxygen electrolysis plant.

the aeronautical industry, for hydrogen is, of course, required for dirigibles and balloons, whilst both hydrogen and oxygen are extensively used in connection with autogenous metal work—welding, or fusing and cutting. The most effective and best-known method of hydrogen and oxygen production is that in which water is decomposed electrolytically, and it is this method that is employed in the Oerlikon system. A large number of Oer-

likon electrolyser plants are now in use, not only in the aeronautical industry but in others, such as metallic filament lamp factories, oil refineries, &c., and a large installation is in use at the Royal Aircraft Factory at Farnborough. This system is specially recommended in cases where an already existing source of power, which is not working at its full capacity, is available for the working of the electrolyser. A very complete plant for welding, &c., can be



A group of the famous Palmer aeroplane tyres.



now be obtained in the following standard sizes and dimensions:—

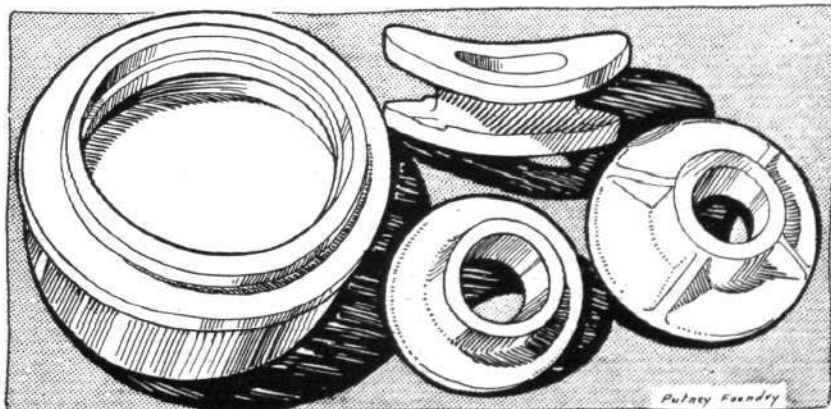
Tyre Sizes.	Wheel No.	Length. mm.	Hub. mm.	Bore. mm.	Track.
300 x 60	16	111.12	25.4	Central	
	17	72.39	12.75	Central	
450 x 60	30	89	31.75	Central	
	12	150	31.75	104/46	
575 x 60	14	150	38.1	104/46	
	21	160	28	Central	
	12	150	31.75	104/46	
600 x 75	14	150	38.1	104/46	
	21	160	28	Central	
700 x 75	9	178	44.45	132/46	
	20	178	38.1	132/46	
	18	178	44.45	132/46	
700 x 100	2	185	55	135/50	
	26	150	40	Central	
	4	185	55	Central	
	18	178	44.45	132/46	
750 x 125	2	185	55	135/50	
	26	150	40	Central	
	4	185	55	Central	
	8	185	55	135/50	
800 x 150	10	185	55	Central	
	23	185	55	135/50	

**Thomas Parsons and Sons, 315-317, OXFORD STREET, LONDON, W.**

It is a generally accepted fact that the durability of plane fabrics can be considerably improved by giving them an outer covering of varnish or paint, over the dope. Much depends, however, on the nature of the outer coating applied, for this must be of such a composition that it will not chemically or otherwise affect the dope and fabric. In fact more harm than good would be done by applying an unsuitable varnish or paint, and the life of the fabric rendered shorter than if it were doped only. Having had over 100 years' experience of paints and varnishes, Messrs. Thos. Parsons and Sons are entitled to take a prominent position in the aviation industry, which they have but recently joined, for the purpose of supplying the right kinds of paints and varnishes to meet the conditions referred to above. Such is their speciality; varnishes suitable for all requirements, and paints in any colour, from tints you could see miles off to others that are all but invisible! In addition the firm supply paints and varnishes for any purpose whatever.

**The Putney Foundry, 207, PUTNEY BRIDGE ROAD, LONDON, S.W.**

THE Putney Foundry, which is a comparatively recent arrival in the industry, undertakes castings of all kinds, in aluminium, brass, and gunmetal, aeroplane and motor castings being a speciality. A few of the castings, picked out at random, which they are now turning out for aircraft are shown in our illustration in order to indicate



A few examples of casting work by the Putney Foundry.

the type of work undertaken. One of the features of the work is that they are exceptionally clean and sound.

**Proctor's Garage, Ltd., PARLIAMENT MANSIONS, ORCHARD STREET, WESTMINSTER, S.W.,**

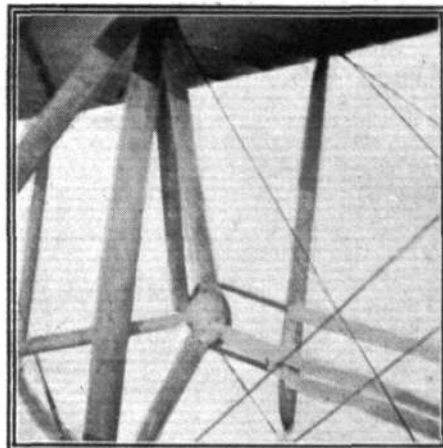
HAVE a speciality in an aluminium solder, which is known as the "A.B.C." aluminium solder, which is meeting with a considerable amount of success.

This solder is the result of a long series of experiments, and the best proof that it is a really good article is shown in the continuous number of repeat orders which are received from numerous well-known manufacturers who have used the solder for a considerable time.

There is one claim in particular which the makers wish to emphasise, and that is that no elaborate preparation of the articles to be joined is required when A.B.C. solder is used (as is the case with some others which have been put forth for aluminium work), all that is necessary being to see that the article should be quite free of acid or grease. A further point is that no flux is required.

**Hans Renold, Ltd., BURNAGE WORKS, DIDSBUY, MANCHESTER.**

ALTHOUGH at the present time chains are not largely used for transmission purposes on aeroplanes, Messrs. Hans Renold are giving the matter full attention and bringing their wide experience to bear in producing suitable chains for the purpose. That they have already proved successful is shown by the photograph illustrating the transmission by Renold chain on the Mann biplane. The

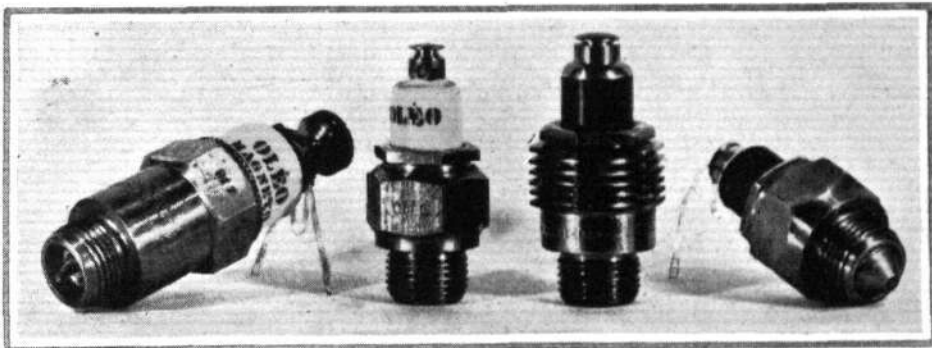


The Renold chain transmission on the Mann biplane.

which without increasing the weight or size appreciably powers of 100 and even more may be transmitted.

**Leo Ripault and Co., 64A, POLAND STREET, LONDON, W.**

THE makers of the famous "Oleo" plugs were one of the earliest firms to cater specially for aviation work, and they now have several types of aviation plugs, giving excellent results on aircraft in the service of the Allied Governments. The best known Oleo plugs are those used on Gnome, Le Rhone, Clerget and other rotary engines.



Some of the Oleo aviation sparking plugs for aircraft supplied by Messrs. Leo Ripault and Co.

photograph was taken in the air, when the speed of the chain was 2,200 ft. per min. The pitch of this chain was 1 in., the width inside  $\frac{3}{8}$  in., the breaking strength 7,800 lbs., weight per foot 1.1 lb.; the horse-power transmitted was about 70. The firm are now experimenting with a view to producing a chain by

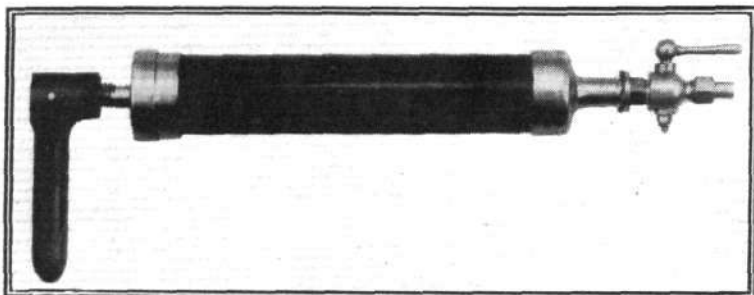
These plugs, which are made with either mica or porcelain insulations, are of simple construction, having a steel body, nickel central electrode and a one-piece insulator. There are three different arrangements of spark gaps, one (No. 2a porcelain) in which the end of the electrode is bent towards the wall of plug, another (mica) in which the body of the plug terminates in a cone with the apex cut to form an annular space round the central electrode, and the other type having three "points" inside the body bent up towards the central electrode. This latter plug also has ribs formed on the hexagonal sides of the body. A large plug for stationary engines is No. 7. This has a deep steel body, two porcelain insulators and a nickel electrode. A space is provided between the latter and the inner porcelain for about halfway up the plug for the purpose of preventing sooting and oiling up. Although early in the war the Oleo factory in France closed down owing to most of the staff having been called up, many of the staff have now been sent back and the works are once again in full swing. We have been told the demand for Oleo plugs now exceeds 6,000 per day.



**The Rotax Motor Accessories Co., Ltd.,**  
GREAT EASTERN STREET, LONDON, E.C.

AMONG the very large assortment of fittings and accessories made and supplied by the Rotax Motor Accessories Co. are many which are more applicable to aircraft. These comprise petrol filters, pressure pumps, catches, thimbles, hinges and map case fittings, water joint clips of the bell clip

by heat or cold, and will not melt, run or drip. It is quite odourless and does not contaminate water—rainwater collected from "Ruberoïd" roofs can be used for domestic purposes. When once laid it does not require tarring, painting or annual attention. It is thus very suitable for roofs of hangars, airship sheds, aircraft factories, &c., in which capacities it is now in extensive use.



A Rotax force pump.

type and a new pattern of narrow section channel brass, which the company are making largely for aircraft engine manufacturers, press buttons, turn buttons, eyelets and washers (including both oval and round patterns). Some years ago foreseeing the great demand which would arise, machinery was put down to supply these special fittings to the Royal Aircraft Factory's requirements. A special department has been formed at the company's Willesden works for the production of streamline wires, complete sets of wires can be supplied for particular types of machines. In spite of considerable additions to the plant in this department, amounting to about 150 per cent., it has been found necessary to institute double shifts to cope with the demand. One feature deserving mention is a landing lighting set designed at the Rotax works, and is based on the principle of the well-known Rotax motor car dynamo lighting equipment.

**The Ruberoïd Co., Ltd.,** 81-83, KNIGHT-RIDER STREET, QUEEN VICTORIA STREET, LONDON, E.C.

"RUBEROÏD" is a roofing material, machine made—by a special process—in the form of sheeting. The principal features of this material are that it is extremely light and pliable, and non-absorbent. It has for its base a fibrous material which has been thoroughly saturated with a secret composition containing no oxidizing ingredients such as tar, asphalt, paper, &c. Some of the advantages of "Ruberoïd" are:—it is easily laid and easily repaired, is unaffected

**Rubery, Owen and Co.,** DARLASTON, SOUTH STAFFS.

WITH an extensive experience in steel work behind them Messrs. Rubery, Owen and Co. are in a position to undertake anything in the way of metal fittings and parts for aircraft, especially in regard to pressed steel and welded tubular work. The accompanying sketches show some interesting samples of steel pressings, such as engine mountings, plane-ribs, &c. They also manufacture a large range of wire strainers, eye-bolts, and such like fittings. Note should be made of the R.A.F. pattern strainer with forked end, shown in the sketch. Other specialities of note are the Rubery-Owen patent release gear for aeroplanes and the Fox wire-bending pliers. The former, in spite of its small size and weight, is exceptionally strong and has proved very successful in practice. The pliers are very simple in action, and bend fairly thick wire with comparative ease, and should be in every aircraft factory.

**Rudge-Whitworth, Ltd.,** COVENTRY.

APART from the production of wheels for which the name of Rudge-Whitworth is known the world over, this firm are now turning out metal parts for aircraft work, especially those for aeroplanes to Government designs, in almost unlimited quantities. The high reputation which has been built up by Rudge-Whitworth production ensures that their work is fully up to standard as regards quality and accuracy and ability to pass any necessary tests.

**Skefko Ball Bearing Co., Ltd.,** LUTON; LONDON OFFICE, 28, VICTORIA STREET, WESTMINSTER, S.W.

EVERYBODY connected with engineering is already well acquainted with the famous Skefko ball bearings, and there is, therefore, no need to go into a detailed description of their design and construction here. The question of reliability is, perhaps, nowhere of such paramount importance as in aeroplane work, and in this respect, as is well known, the Skefko ball bearings have an excellent reputation, possessing with their self-aligning double-row of balls a very high factor of safety.

**Speirs, Ltd.,** 13, BLYTHSWOOD SQUARE, GLASGOW.

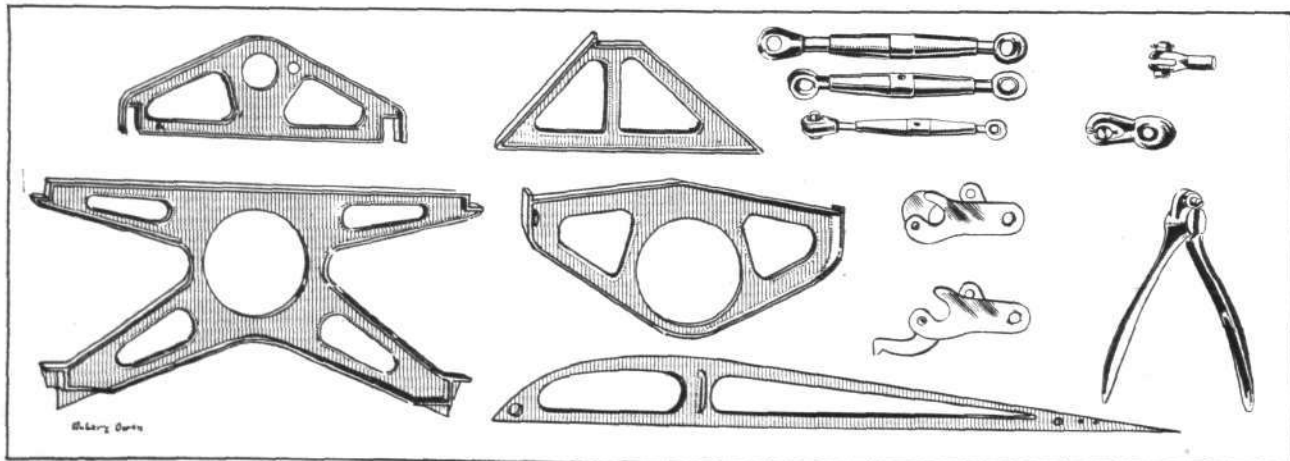
THIS enterprising Glasgow firm of designers and erectors have been remarkably successful in their efforts to produce buildings intended to afford convenience and comfort, and yet being cheaper than ordinary stone or brick buildings. The introduction of the "Speirsesque" system marked a new departure in structural engineering, providing a most satisfactory alternative to ordinary brick buildings, especially suitable for sea-plane sheds, hangars, workshops, &c.

Although called iron buildings the "Speirsesque" structures are really composite in character, having a framework of well seasoned timber covered externally with specially manufactured galvanised corrugated steel sheeting.

For many years the firm has been experimenting in their workshops with alternative exterior coverings with materials brought from the Continent, from America, and even from far Japan, in order to discover one of a solid and substantial yet economical nature, which could be used in place of corrugated iron, to which some people have expressed aversion. As a result of these researches, they devised a combination described as "Plasmentic," which fully meets the high standard of efficiency demanded. The Speirsesque "Plasmentic" cement rough cast construction is absolutely permanent, it is indistinguishable externally from a brick rough-cast building, whilst the cost is considerably less.

**The Sperry Gyroscope Co., Ltd.,** 15, VICTORIA STREET, S.W.

FUNDAMENTALLY the Sperry gyroscopic stabiliser consists of a set of four gyroscopes controlling, via a Servo motor, the transverse and longitudinal attitude of the aeroplane. An electric generator driven from the engine furnishes the current that drives the gyroscopes, the speed being kept constant by means of a governing device through which direct drive is obtained when the



A few of the fittings, stampings, &c., produced by Messrs. Rubery, Owen and Co.



14 B.  
Twin Points.



14 I.P.  
Single Point.

As used on  
Stationary  
Aviation  
Engines.

# Hobson

## SPARKING PLUGS

ARE

Reliable and Efficient.

This is why they have been chosen by  
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No  
Advance



No  
Shortage

29, VAUXHALL BRIDGE ROAD, LONDON, S.W.



No. 12 B.  
As used on  
rotary  
Gnome,  
Rhone, etc.,  
Engines.

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In Black Chrome dressed Leather, lined warm tweed	Price	84/-
Do., made with Camel Fleece lining	"	95/-
In Tan Leather, Chrome dressed, lined camel fleece	"	£5 10 0

### AVIATORS' BREECHES.

Black Leather Breeches, wool lined	Price	37/6 & 42/-
Tan Leather Breeches, wool lined	"	42/- & 63/-

### AVIATORS' CAPS.

The "Brooklands" (as illustrated). In black or brown leather, lined fleecy wool, with protective rolls for the ears and tapes to tie under chin. Finest quality ... Price 12/6

The "Aerocar," the cap for flying. In black or brown leather, lined with fur. Will keep the wearer warm at the highest altitudes. Wind cannot penetrate ... Price 21/-

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The Gamage Patent Non-Concussion Flying Helmet. Fitted with patent flaps for minimising the sound of the engine ... Price 47/6

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The "A.W.G." High Legs, Quality "A," made of fine quality Brown Waterproof Hide Fronts and Golosh and Sheepskin legs—Caracul fur lined all through, exceedingly warm and comfortable ... Price 45/-

Also made in Quality "B," uppers are of Brown Waterproof Hide, lined with thick Caracul and have also an inter-lining of warm material, are impervious to WIND, COLD, RAIN, ICE-WATER, SNOW, etc. ... Price 50/-

Usual height of both these boots is 18½ inches.



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**WE are ACTUAL MANUFACTURERS, also**  
**Contractors to His Majesty's Government.**

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**THE STRONGEST GLUE KNOWN**

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which also has the great advantage of being  
 USED COLD AND RESISTING DAMP

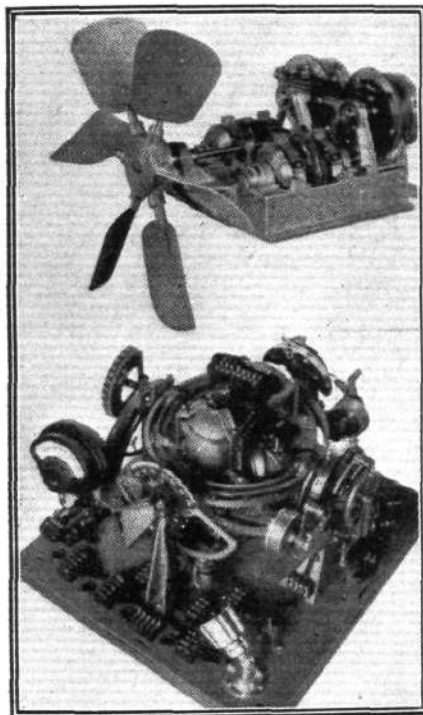
**THE IMPROVED LIQUID GLUES Co., Ltd.,**  
 Great Hermitage Street, London, E.  
 CONTRACTORS TO H.M. GOVERNMENT.



engine is going "all out," and indirect drive when the engine is throttled down.

Stalling the aeroplane is made impossible, where this stabiliser is fitted, by an anemometer, which is in reality a double-throw switch controlled by a fan. So long as the air speed of the machine is above the minimum speed at which the particular aeroplane will maintain horizontal flight, the anemometer fan keeps the switch over. If the speed is reduced to a dangerous extent the spring incorporated in the anemometer overcomes the torque of the fan, and the switch is thrown over, setting the elevators in motion until by the ensuing glide the machine has regained sufficient velocity, when the fan overcomes the tension in the spring, and returns the switch to its normal position.

A small universal hand-control lever mounted on the proper control lever actuates the latter *via* the gyroscopes and Servo motor by altering the relationship between the body of the aeroplane and the reference plane. If the pilot wishes to climb he pulls this little lever towards him, and if left in this position the



The Gyroscopic unit (below) and the Servo motor (above) of the Sperry Gyroscopic stabiliser.

machine will continue to ascend at the angle corresponding to this position. Similarly, for banking, the lever is moved to right or left.

In addition to the gyroscopic stabiliser this firm are making a drift indicator, which, as its name implies, shows the path followed by the aeroplane in a cross wind. This indicator, which was described in "FLIGHT" a short time ago, consists of a prismatic monocular telescope through which the path of the aeroplane can be observed. This is fitted with parallel wires, and is connected to the special Sperry compass, manufactured also by this firm, by Bowden cables. By turning a handle until the wires are parallel with the path followed by objects on the ground the lubber line of the compass is shifted to compensate for the drift. A telescope capable of being stabilised at any desired angle relative to the horizontal has been developed by this company for military purposes. In principle this apparatus is similar to the gyroscopic stabiliser.

**Sphinx Manufacturing Co., 242, BRADFORD STREET, BIRMINGHAM.**

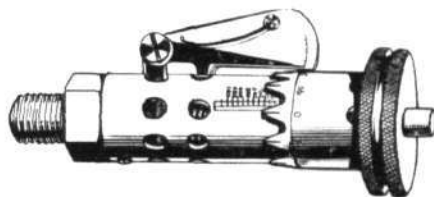
AMONG the many patterns of ignition plugs made by this firm are several which are specially suitable for use on engines, whether rotary or fixed, for aircraft work.

**S.R.O. Ball Bearing Co., 115, SOUTH-WARK STREET, S.E.**

SOME of the advantages claimed for the improved SRO ball bearings supplied by this firm are: The cage is made in two parts of stamped sheet steel assembled by means of stay bolts riveted by a special process. Owing to the peculiar construction of the cage, which stops short of the plane passing through the centres of the balls, there is no friction at the points of greatest surface speed of the balls. Moreover, the grooves or channels in the rings which form the ball races are made of a depth which enables the ball bearings to withstand an axial thrust equal to one-third radial thrust when both thrusts are acting at one and the same time. The SRO ball bearings are made in all sizes and for any special purpose.

**George Taylor (Brass Founders), Ltd., BOLTON.**

THIS firm's speciality consists of the "Okill" pressure indicator, an instrument which measures the maximum degree of pressure on each working stroke in any particular cylinder of an engine. It also measures the maximum degree of compression attained during each compression stroke. It is an exceedingly simple instrument, as the accompanying illustration will show, and



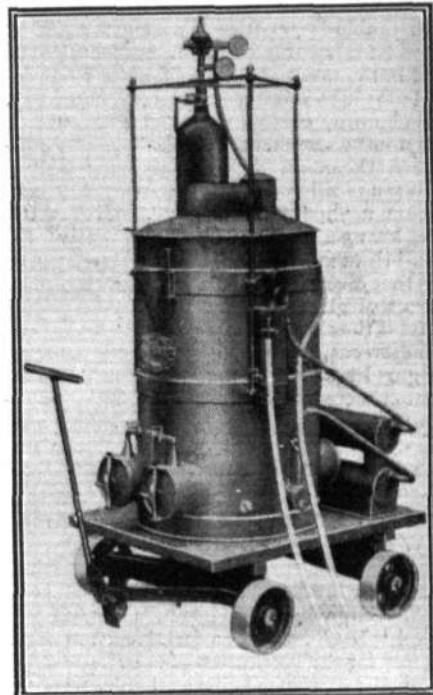
An Okill pressure indicator.

all that is necessary to do when it is desired to test any particular engine cylinder is to screw the indicator either in one of the two sparking plug holes where dual plugs are fitted, or some other convenient hole, so long as the cylinder tested is able to fire as usual. The engine is then run in the ordinary way, and on making certain adjustments to the instrument a pointer on the latter indicates the necessary data. Many of these instruments are in use, and they can be supplied

calibrated from 400 lbs. per sq. in. up to 2,000 lbs. per sq. in. Messrs. Taylor also make high-class brass taps, valves, and many other fittings, and can supply parts and fittings to special instructions.

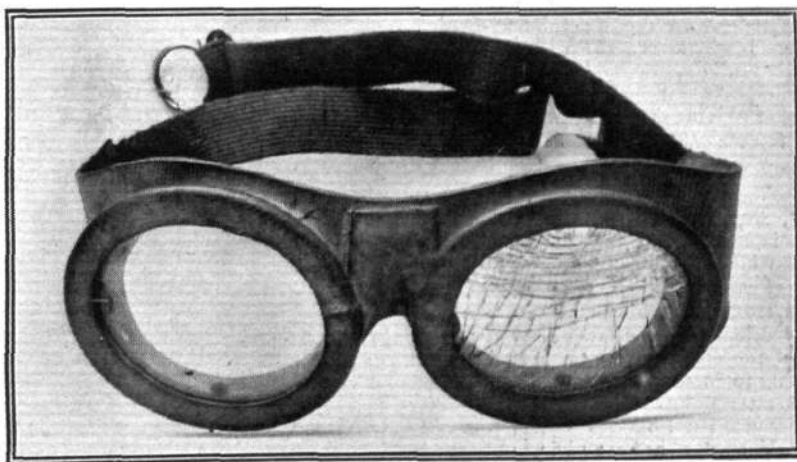
**The Thorn and Hoddle Acetylene Co., Ltd., 151, VICTORIA STREET.**

TO meet the demand for the oxy-acetylene process of welding in connection with aircraft work Messrs. Thorn and Hoddle supply a variety of oxy-acetylene welding outfits of both the high and low pressure systems. The only difference between the two is that in the high pressure type the fuel gas is drawn from a cylinder of dissolved acetylene, while in the low pressure type it is supplied



An Incanto Oxy-acetylene welding set made by Messrs. Thorn and Hoddle.

from an acetylene generator. Under the trade name "Incanto" the firm supply two styles of low pressure plant, one known as "K," intended for a more or less permanent installation, while pattern R is designed with a view to portability, the generator, &c., being mounted on a truck or trolley. Both styles are made in several sizes, the carbide capacity ranging from 6 lbs. to 75 lbs. Three sizes of high pressure welding plants



A pair of Triplex goggles which have been involved in an aeroplane smash.

are stocked as well as a complete outfit mounted on a trolley.

In addition to welding plants this firm also supplies oxy-acetylene metal-cutting outfits and all necessary accessories for this as well as the welding plants, including high and low pressure blow-pipes, purifying apparatus, oxygen pressure regulators, hydraulic back pressure valves, oxy-acetylene metal cutters, and all welding materials.

**The Triplex Safety Glass Co., Ltd.,**  
1, ALBEMARLE STREET, PICCADILLY,  
LONDON, W.

TRIPLEX Safety Glass is so well known to most of our readers that it needs no introduction here. Suffice it to say that owing to its peculiar construction it possesses remarkable properties inasmuch as it is considerably stronger than ordinary glass, and in the event of an accident it is impossible for it to splinter or fly into fragments. It is built up of two sheets of glass with a sheet of transparent xylonite cemented between them, all three being amalgamated into practically one solid piece by means of enormous hydraulic pressure. No matter how heavy a blow the glass may receive, the non-brittle xylonite holds the glass together so that even if the latter cracks no loose pieces of glass can cause damage. Triplex glass is thus particularly suitable for goggles, windcreens, and map covers, &c. The pair of goggles shown in the accompanying illustration were involved in an aeroplane accident, and it will be seen that although one of the eye-pieces has been severely "strafed" it still remains in place, without any loose fragments.

**Vacuum Oil Co., Ltd.,** CANTON HOUSE,  
WESTMINSTER, LONDON, S.W.

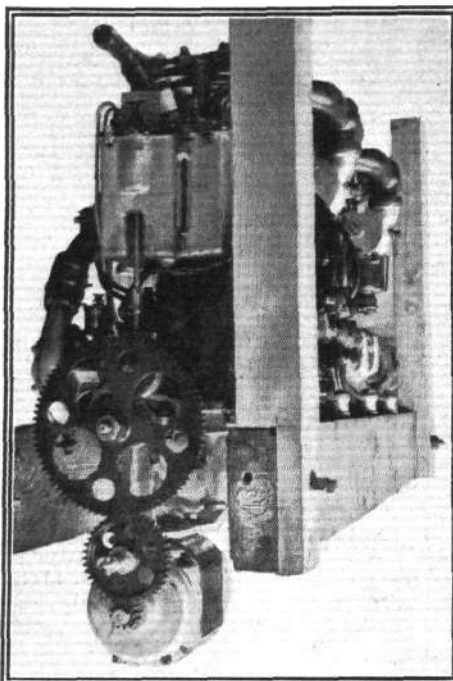
SOME of the Vacuum Co.'s standard motor car lubricants, viz., Gargyle Mobiloil "A," Gargyle Mobiloil "B," Gargyle Mobiloil "BB," have been found entirely satisfactory for the lubrication of practically every type of aeroplane engine available, with the exception of the valve in piston rotary type, which calls for a lubricant which does not come within the scope of the company's activities; the design of such engines making it impossible to use regular motor oils. For the Green engine Gargyle Mobiloil "A" is recommended for the 6-cylinder, and Gargyle Mobiloil "BB" for the 12-cylinder type. Nearly all 8-cylinder V-type water-cooled aviation engines of the Renault, Sunbeam, Wolseley, and similar types give best results on Gargyle Mobiloil "BB." Some users prefer various mixtures of Mobiloil "A" and Mobiloil "BB" to suit varying conditions. Air-cooled engines of the non-rotary type, which require a heavy-bodied oil, are best lubricated with Gargyle Mobiloil "B."

These oils are standardised and obtainable throughout the world in various packages, graded from a 40-gallon barrel to a quart can.

**C. A. Vandervell and Co.,** WARPLE  
WAY, ACTON.

It is but natural that in view of the success which has been attained by the C.A.V. electric starting and lighting system for cars that the firm should have applied their experience to aircraft. Now that the power of the engines used on aeroplanes is continuing to increase a starting device has become an absolute necessity. With but little modification from the standard model the C.A.V. starter has been giving very good results. In the case of a 90 h.p. Beardmore engine the motor was hung beneath the crankcase, driving the crankshaft through

spur-gearing, a large wheel being mounted on the crankshaft, a small wheel on the electric motor and an intermediate idler wheel. With a battery, gears and fittings the outfit weighed less than 84 lbs. The h.p. delivered by the starter was 1.2 and with a specially constructed 12-volt battery, if fully charged and used intermittently, about 30 starts could be made.



C.A.V. starter fitted to a Beardmore aero engine.

Where weight is not a serious matter it is a fairly simple matter to arrange to add to the equipment a small dynamo driven by the engine, thus furnishing the current for charging the battery and also providing the current for a headlight for use when landing in the dark or for illuminating the instrument board.

**Vislok, Ltd.,** 3, ST. BRIDE'S HOUSE,  
SALISBURY SQUARE, LONDON, E.C.

ATTENTION has previously been drawn in the pages of "FLIGHT" to the undoubted merits of the Vislok safety lock nut, which is unique in its efficiency combined with

point of investigating for themselves the advantages it possesses over the more usual methods.

As regards the nut itself and its action, the accompanying sketches should be all-sufficient. It will be seen that the nut consists of two parts that are hydraulically pressed together so as to be inseparable. On each of the two portions comprising the nut is cut a line, and when these are in register with one another the internal thread is continuous, and the nut can be screwed on to a bolt in the usual manner. When in position, which may be anywhere on the bolt, the upper part is then given a further partial turn, and the nut is then secure against any automatic slacking off due to vibration. To remove, the lines are brought once more into coincidence, and the nut unscrewed as a whole.

No special tools are needed for its operation, there is no drilling or other special preparation required for the bolt, the threads are undamaged and can be used repeatedly, and there are no loose parts whatever. They are made in practically all sizes in Whitworth and standard threads, and Messrs. Vislok, Ltd., the makers, are prepared to send samples for test to any aeronautical firm making application.

**Wadkin and Co.,** NORTH EVINGTON,  
LEICESTER.

To makers of aircraft the name of Messrs. Wadkin & Co. (as specialists in woodworking machinery) is already well known.

The patent strut forming and sandpapering machine has been adopted by many of the leading aircraft manufacturers, and is proving highly successful. With it they are enabled to turn out accurately shaped struts in a time unheard of by the old methods.

Another ingenious product of Messrs. Wadkin & Co. is the propeller shaping machine, which was illustrated in "FLIGHT" of October 22nd, 1915. It is arranged to accurately shape from the laminated state propellers with two, three or four blades, and experiments have proved that the time saved in production should make the machine invaluable in propeller making.

Another machine is a double spindle moulding machine with ball bearings. This has many distinct advantages, the chief ones being the spindles, which are of high quality steel, having the chucks bored and ground to a standard Morse taper. The loose top pieces and French spindles have tangs turned

Sketches showing the Vislok lock-nut complete and sectioned to show its construction.



FIG. 1

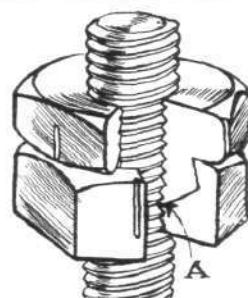


FIG. 2

simplicity. Its growing use in all classes of engineering work is therefore not a source of surprise, and many are the responsible firms and other bodies who are now submitting it to tests with a view to ultimate adoption. The Admiralty has already done so, not only for sea-going ships but also for its airships, so that other aircraft makers who have not already done so should certainly make a

and ground to a corresponding Morse taper, which ensures accuracy in running when the loose spindle or top piece is fitted and secured tightly. Another point is the housings inside the machine frame which enclose the spindles on three sides, leaving an aperture sufficiently wide to allow the passage of the belt. This obviates "choking" the spindles with dust and chips, and affords protection



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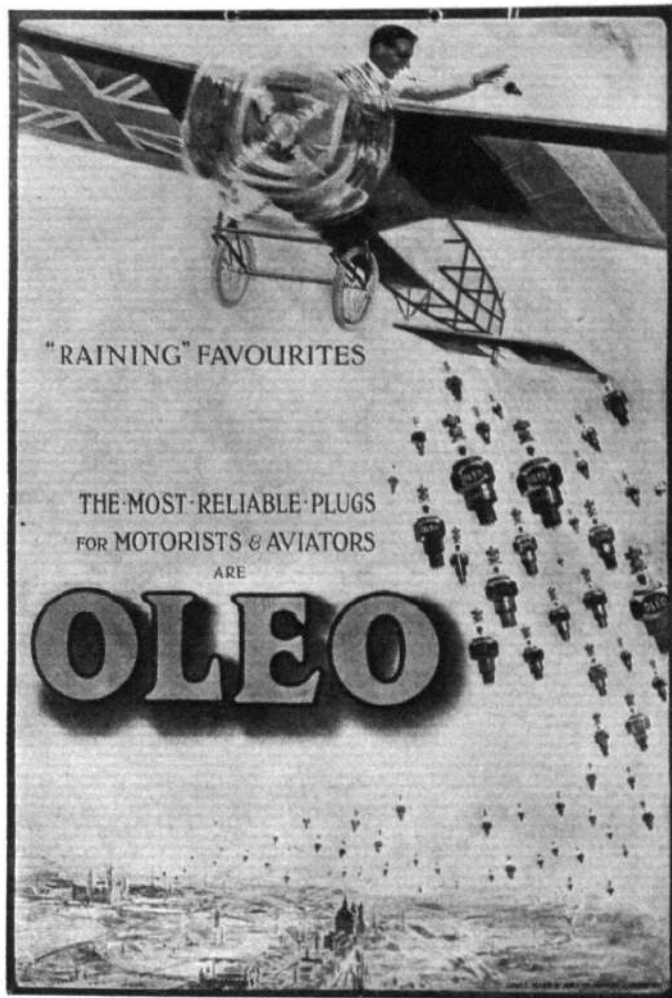


### The Tielocken Burberry (Patent)

A great favourite with airmen on account of its easy method of fastening—a strap-and-buckle replaces buttons—and the double protection it affords from throat to knees. Naval patterns in Slimmer cloths of Regulation blue-black colour.

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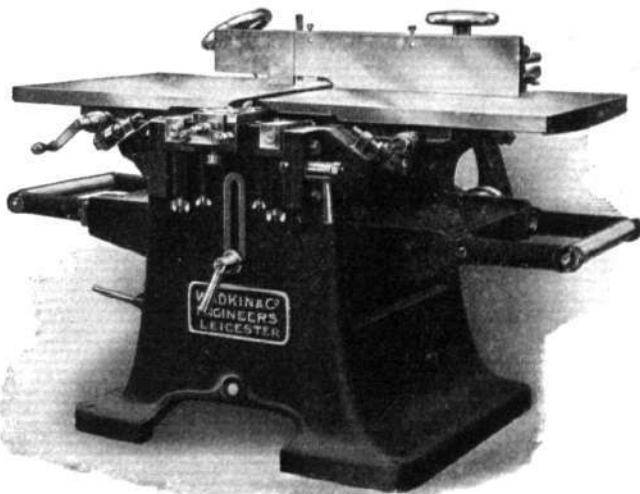
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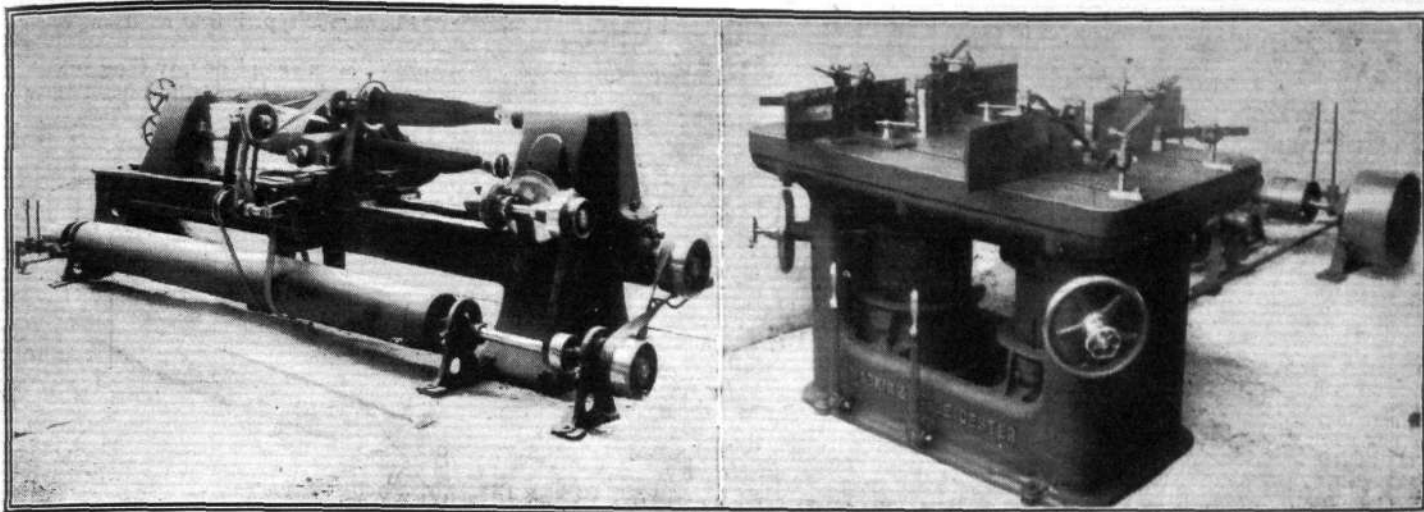
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Telegrams : "Overturned, Wands, London."

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A strut moulding machine and a vertical spindle moulding machine, both made by Wadkin and Co.

to the operator in case of belts breaking. The frame of the machine also is so designed that it supports the worktable at the extreme edge, thus obtaining extra stability and rigidity even when the spindles are running at the highest speeds.

Messrs. Wadkin and Co. also specialise in band saws, planing machines, jig saws, saw benches, thicknessing machines, and other tools used in the production of wooden parts for aircraft. Cutters and small tools have also received attention, and a well-organised and efficient department is in full swing turning these out in large quantities.

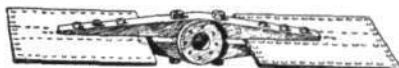
**C. C. Wakefield and Co.,** 30 AND 32, CHEAPSIDE, LONDON, E.C.

WAKEFIELD CASTROL "R" heavy or Gnome-Castrol, "the one oil for all engines," is exclusively used and recommended by the Gnome and Le Rhone Engine Co. Used by the British Naval and Military Air Services, and as well as those of the Allied Forces. It is impossible to detail all the many successes in which "Castrol" has played an important part, but it may be recalled that Gnome-Castrol was used by H. M. Brock in his triple victory last year in the London-

Manchester-London, and London-Brighton-London, and London-Paris-London races. In our photograph he is seen filling up with Castrol just previous to the start of the last-named event.

**W. and G. Walker and Co.,** EMERY HILL, WESTMINSTER, LONDON, S.W.

In addition to their standard fan brake dynamometers for measuring the horse-power of petrol engines, Messrs. Walker and Co. also supply a special aviation model,



A Walker fan brake dynamometer for aero engines.

which is shown in the accompanying sketch. The method of measuring the horse-power of an engine with the Walker Dynamometer is very simple and reliable. A pair of plates are adjusted on the arms, which are secured to the engine shaft. The engine is then run and the number of revolutions taken, and on referring to a specially prepared chart—supplied with the dynamometer—the h.p.

is read from the curve corresponding to the particular radius at which the plates are adjusted. The arms of the aero model are made of ash, and are mounted on a boss which fits on the engine shaft in the same manner that a propeller or tractor screw does.

**The Whitehead Aircraft Co., Ltd.,** OLD DRILL HALL, TOWNSEND ROAD, RICHMOND, SURREY.

ALTHOUGH being themselves busily engaged on the construction of aeroplanes, this firm, by good organisation of their shops, and by making the best possible use of their works, have been able to produce not only the fittings to meet their own requirements, but have facilities for supplying wiring plates and blanks made to R.A.F. specifications at short notice. Among other accessories the Whitehead Aircraft Co. make a speciality of turnbuckles, of which they are in a position to give quick delivery. Manufacturers who experience any difficulty in obtaining any of these fittings would do well to communicate with this firm.

**Whitely Exerciser, Ltd.,** 35, SOUTH-WARK BRIDGE ROAD, S.E.

WITH their long experience in connection with braided rubber cord this firm are making a speciality of supplying British-made

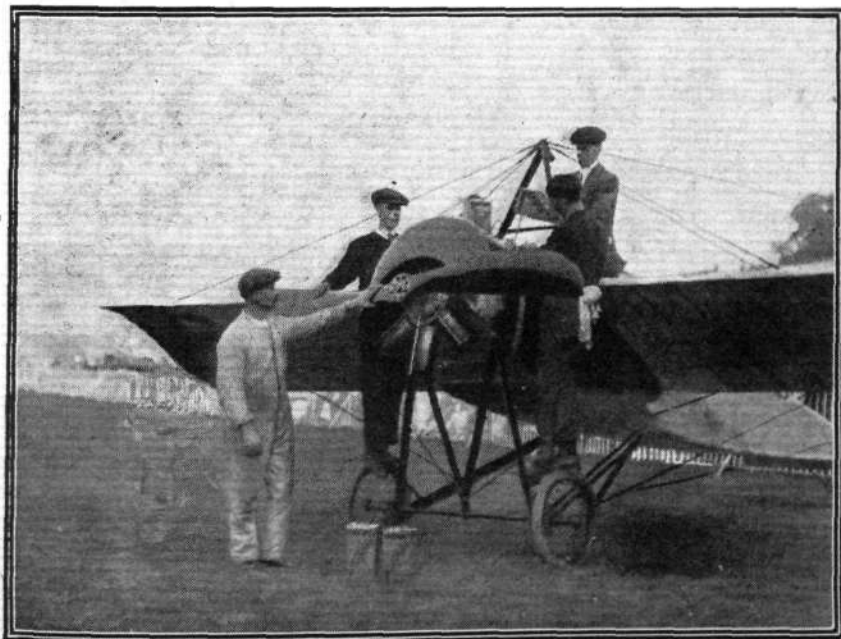


A Flexten shock-absorber made by the Whitely Exerciser, Ltd.

rubber springs for shock absorbers for aeroplane work. Their Flexten shock absorbers are supplied in various styles complete with the necessary fittings, but being actual manufacturers they are in a position to comply with special designs for any strength and duty.

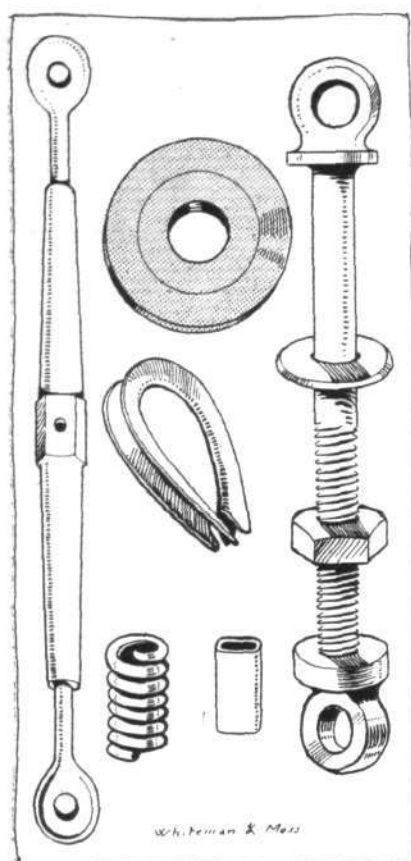
**Whiteman and Moss, Ltd.,** 15, BATEMAN STREET, DEAN STREET, LONDON, W.

ONE of the first firms in this country to lay themselves out for the supply of general parts, small fittings, &c., for aircraft. Messrs. Whiteman and Moss in normal times carry a large stock of parts that are in constant demand. At the present moment, however, under the exceptional circumstances that now prevail, they naturally find it somewhat difficult to keep up with the orders for certain items. In some cases where early delivery could not be promised, orders have been refused, the policy of the firm being



Brock filling up with Castrol previous to starting in the London-Paris-London Race.





Some specialities of Messrs. Whiteman and Moss.

only to take orders which can be executed in proper time. Just now, however, they have a good stock of wire ferrules, copper ferrules,

bevelled washers, steel and brass thimbles, fabric tacks and washers, wire, and such like fittings, some of which we illustrate. Enquiries will be given prompt attention, and notification as to their ability to supply will be given.

**Yorkshire Engineering Supplies, Ltd.,**  
HUNSLET ROAD, LEEDS,

ARE the sole makers and sellers of the well-known Y.E.S. phosphor bronze specialities, that are cast by the "Eatonia" water-cooled process. Mention may be made of a few of these Y.E.S. specialities: The "Aero" bronze, which is used extensively on R.A.F. engines; the "15" bronze, which is specially suitable for motor chassis bearings; the "Worm Wheel" bronze, possessing great durability. All these have a high tensile strength, and are absolutely homogeneous.

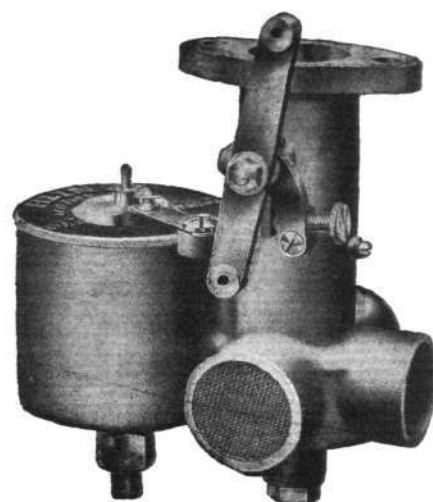
**The Zenith Carburettor Co., Ltd.,** 40-42, NEWMAN STREET, W.

BEING so well known the British-made Zenith carburettor needs little description here. Suffice it to recall its chief characteristics, the two petrol jets disposed concentrically, one being the compensating jet which automatically adjusts the mixture to the piston speed, thus avoiding too rich a mixture at high engine speeds and too weak a mixture at low engine speeds.

A variety of sizes are made enabling the firm to meet the requirements of makers of aero engines of varying types, ranging from the lowest powered rotary or radial to the highest powered water cooled Vee motor. Apart from the question of sizes, two distinct styles of carburettors are manufactured, a vertical and a horizontal type, the principle of both being the same in both cases, the only difference being in their general arrangement; in the vertical type the intake pipe is parallel to and concentric with the jets, while

in the horizontal type it is at right angles to them.

For use on an aeroplane travelling at high speeds and great altitudes, the question of



One of the latest pattern Zenith carburettors.

heating the air supplied to the carburettor is one of great importance, and in this respect the Zenith lends itself readily to heating either by means of water or hot air. Which of the two forms of heating to employ depends, of course, on the type of engine used.

In France the Zenith carburettor is now fitted as standard to a great number of French aero engines, while in this country the number used by leading manufacturers is rapidly increasing.

## ~ CLOTHING AND AVIATION ~

I LIKE to think that the Germans are responsible for most of our troubles; I could even, by a slight stretch, imagine that it is their fault that I have to wear clothes.

In the earliest days when the greater part of the North Sea seems to have been a marshy plain over which the Thames meandered to join the lower course of the greater Rhine, which discharged itself into the distant Arctic Ocean, neolithic man knew nothing about weaving.

Though still a mighty hunter and fisher, he had domesticated the dog, the ox, the sheep, and the hog, and was not entirely reliant on the proceeds of the chase for his existence, but he had not descended to weaving.

Then in the Bronze Age the brachycephalour, or round-headed man (surely Embryogeny Germanic), came from somewhere over the marsh, superseded neolithic man, and introduced weaving.

Many years later, a tribe of Germans from the south-east of Schleswick came over and settled in Britain, and gave it the name of England. I approve of England; I am proud to be an Englishman, but I could find it in me to wish I did not have to thank Germany for the name. I could easily lay some small blame on those early neolithic men, and later, on those other tribes who were for ever scrapping for the possession of this land, that they did not sweep the whole lot of the roundheads into the sea; I might not then have had to wear clothing other than the skins of animals.

Did I have to go out and shoot a new overcoat, or net a pair of lower garments, I think it would quite fit in with my idea of things as I should like them, but to go to a shop and choose, and try on, does not seem to me to be the business of men.

Had I no fear of being mistaken for a wealthy man, I would perambulate my way through my allotted span in clothing that should worry everybody except myself.

And thou, O Aviator, being of my gender, art of my way of thinking. Thou soarest in the high air in thy summer raiment when the cold of our winter season is upon us, and because thou hatest shopping thou wrappesst thyself about beneath thine outer

garment with the large sheets of a daily paper which doeth everything for aviation, yea, even to keeping its disciples warm.

Withal, you require winter clothing. Could it be spread out in splendid profusion at your aerodrome, and you had nothing to do but choose and pay, you would refit in no hesitating manner. But to make the round of London's show-rooms, to walk up to an immaculate being of your own sex (generally in the wrong department) arrayed in faultless morning attire, and explain that you require a leather overcoat lined with sheep-skin woolly side out, arouses in you a feeling of humbleness which his "Step this way, sir" cannot entirely remove. And in your agitation, being a man, you are pleased to grab the nearest available article to your requirements, and—wish with me that clothing could still be shot or speared.

You are to be spared this embarrassment. The order has gone forth that I, who dislike shopping even more than you, shall visit all the showrooms, interview on your behalf the heads of departments, inspect and report, and generally clear the way for you so that you have but to proceed to the Aviation Department of the stores of your choice, ask for Mr. —, and he will greet you as an old friend.

I hope it is now perfectly clear to you that I am going to talk about clothing, and not geography. I am going round the shops on your behalf, but I see no reason why you should not come with me—in these pages; so let us start on our tour, and get down to the realities of this twentieth century.

In my quest on behalf of the aviatic world I have made up my mind to note only what I consider a real boon, and with that thought in my mind, naturally Harrod's suggests itself for a first visit. The entrance we require is at the side, in the eastward end of the huge building, and the aviation clothing department is on the ground floor. Asking for Mr. Gillins, we are instantly in touch with what we require.

Here are some of the lines I recommend for inspection. Long coats, short coats, three-quarter coats—how shall I ever describe them? Sheepskin jackets, lambswool waistcoats, leather suits,



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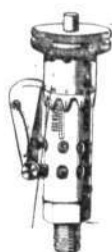
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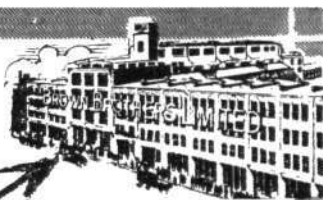
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"Big oaks from little acorns grow."



A couple of complete rig-outs at Harrod's.

overalls, underalls, gloves, boots, caps—oh dear! A beautiful aviator's three-quarter coat (the adjective governs the coat) in black or tan sheepskin, chrome dressed, and really soft. All-round belt, large side pockets and diagonal map pocket; double breasted, with extra wide overlap fronts, and double collar to turn up, with cross piece to button over the throat. Lined with dark grey fleece, it makes a really serviceable coat. The same in half length, at less money but no reduction in quality.

Complete leather trouser suits in black or tan, and a Naval coat, also in both colours, with the usual side pockets and large map pocket.

Gloves of every description, lined with every conceivable material calculated to keep the hands warm. One, in particular, I noticed, with the underside of the finger tips left unlined in order to facilitate the feeling of switches. Another good line is a gauntlet glove, lined with fleece, with waterproof canvas backs and leather fronts, and strap fastening.

Flying caps of every description, lined with fur, or fleece, or unlined. Helmets, wool under-caps. Long boots, short boots, boots lined and boots unlined; everything one could possibly want in the way of equipment. There! I don't think that is so bad for a start.

In these strenuous times it is proper to economise in fares, and it being a lovely day, we will walk through St. James' Park to Piccadilly Circus, where, on the corner, but numbered 30, Regent Street, are the **General Aeronautical Company**, known the world over as the "G.A.C." Obtainable here is everything connected with aviation, from an engine to a pair of goggles. In clothing, they specialise in Kapok, that wonderfully light, waterproof, warm, vegetable wool, which in addition to other qualities, is buoyant in water, thus acting as a life-saving jacket should mishap befall an aviator when over water. The material is used in a number of forms, principally in the shape of undercoats and waistcoats. In the waistcoat form, they may be had made up in the ordinary way, to button down the front, or simply with straps over the shoulders, looking very much after the style of the cork jackets worn by lifeboat men.

In jacket form, it is made not quite so thick, and with sleeves, the Kapok in this case being sandwiched between flannel, and made more with the idea of warmth than with life saving, although even with the lesser amount of Kapok, the buoyancy is remarkable, and quite capable of keeping the wearer afloat in smooth water.

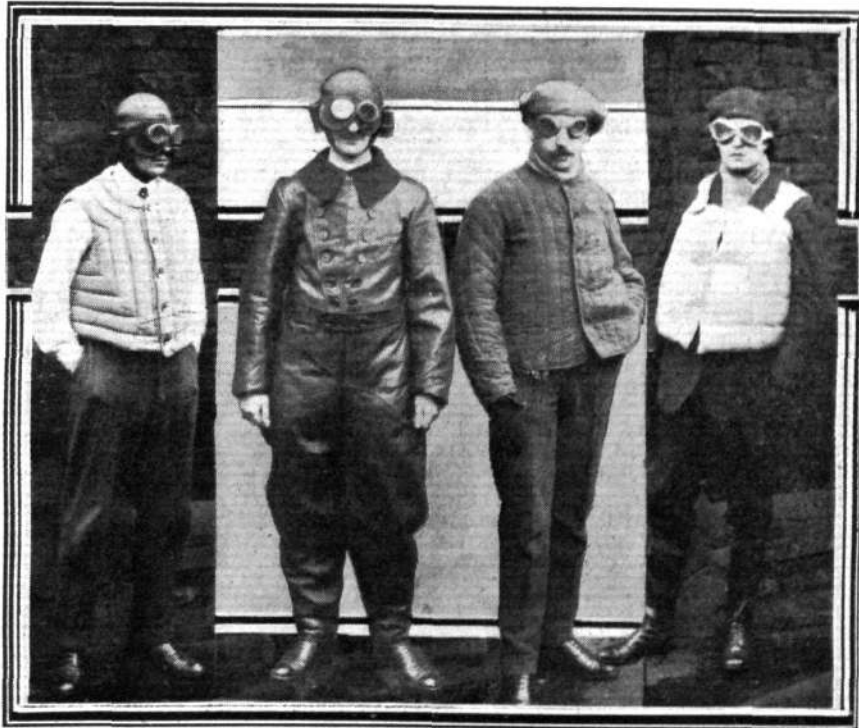
A one-piece suit in black, chrome dressed leather, is also a speciality, it being also Kapok lined, although, of course, to a lesser extent than the life-vests primarily intended for life saving. Nevertheless it should be very buoyant, and it certainly is beautifully made. It has an all-round belt, and the leg is fitted with buttons for some distance upwards from the ankle, so that the wind is prevented from entering. Although not strictly an article of clothing, as Kapok is again used, mention may be made of their sleeping bag. In this case, it is used purely on account of its warmth. The bag is in waterproof sheeting, and the lining makes a very snug article in which to pass the night when compelled to rest on the earth. With sleeping bags in general, the difficulty is to get into them and out of them, especially the former.

This particular bag has one of the neatest arrangements possible to obviate having to get in at the top, feet first. Some bags button over, but there one has to sit up and start the buttoning process at the bottom. In the bag in question, there is fitted a very fascinating arrangement of a kind of hook-and-eye chain on each side. The fastening is accomplished by simply pulling a loop fastened to a little fastening disc or wheel, which runs along and fastens the whole thing up. Just how it is done I cannot say, but it is a most ingenious device. To emerge in the morning, all one has to do is to take hold of the two sides of the bag as though trying to tear it apart when the little disc retreats to the bottom, opening the bag on its journey.

And so to **Burberry's** in the Haymarket. To expatiate on Burberry goods is about on a par with trying to paint the sky blue, but as the lines there dealt in are entirely Burberry, we ask for Mr. Doman, and proceed to investigate their unique examples of high-class tailoring.

The "Tielocken" long flying coat is just the very thing for the purpose. The material is absolutely weather-proof, and it has an exceedingly great overlap front, extending right to the bottom, so that the legs cannot get wet through the blowing up of the coat. To further prevent this happening, there are straps through which one can pass the legs, which yet do not interfere with walking. It is made in two colours, khaki for military wear, and blue for naval wear, and being of material in the place of the usual leather, it is almost impossible to tell the coats from those cut from ordinary cloth. The belt is of the all-round type, but, as unusual, it adjusts both back and front. Side pockets are provided, and the collar can be used in three positions. A feature of this coat is that there are no buttons—all fixing being accomplished by easily-adjusted straps and dome clips.

"Garbadine" is a material used in many ways, including the manufacture of complete flying suits, after the style of the well-known leather suits, but here with distinctive features with regard



Ideas for safety and comfort at the G.A.C.





Aviators' outfits seen at Burberry's.

to cut and finish. The material is weather-proof, as distinct from water-proof only. It will throw off any quantity of rain, and yet give ventilation to the body, which it also keeps warm at low temperatures. Sir Ernest Shackleton used a suit of this material on his Antarctic Expedition, and expressed, in a letter, his admiration of its ability to keep out the wind and cold in a blizzard. As all the world knows, military coats and uniforms, as also naval, may here be obtained in the firm's weather-proof materials—these including that of the Royal Flying Corps.

In addition there are fur-lined under jackets with sleeves. Long under coats lined with camel fleece. Flying caps lined with fleece or garbadine, and warm clothing of every description.

One good line in gloves is a pair made of horseskin. To look at they appear to be brown suede, but their speciality is that they always remain soft. When wet they do not get "sodgy," and when they dry they dry soft and flexible, so unlike the usual leather glove, which will generally dry hard and stiff. They are, I need scarcely say, lined throughout with fleece.

Much more as there is here to inspect, we must away to our next call at **Gamage's**, to be further mystified with the thought and care that has been put into aviation clothing and equipment on the flyer's behalf. Here, following our custom of getting on the spot quickly, we ask for Mr. Kent of the aviation department, whom and which we find on the first floor.

To say that Messrs. Gamage have entered into the equipment of aviators with the same thoroughness that they enter into everything which they undertake, is to say here everything that could possibly be wanted will be found. As our mission is more especially concerned with clothing, it will be but necessary to say that all accessories appertaining to flying are stocked in great variety. Goggles, wrist watches, map cases, note books, pocket books, sketch blocks, and the like, too numerous to mention. Leggings and boots in all conceivable forms, and in rubber or leather, lined or unlined. But to our clothing.

Here again we have the favourite black or tan leather flying coat, fleece-lined as usual, and in three lengths. This particular form of coat is in such universal demand among aviators that it is not surprising that in nearly all outfitters' stock it is one of their leading lines. Even so, there is always some slight difference in the cut, or the shape, in the method of fastening, or in the arrangement of pockets, making inspection well worth while.

An article worthy of attention, is a sleeved waistcoat, made of goat and rabbit skin, with the fur outside, and lined with fleece. Worn under an unlined leather coat, generally used in summer flying, it is ideal, though there is no reason whatever why it should not also be worn under a winter coat, and thus secure the extra warmth.

Not always are under-jackets supplied with a storm-flap, this function being left to the outer coat, but here is one in leather which is so fitted, and one advantage is, that when flying in ordinary weather, and there is no necessity to turn up the huge collar of the greatcoat, this storm flap prevents the wind from penetrating to the chest, and that without the inconvenience of the other.

A great variety of under-jackets and waistcoats, in all materials from leather to camel fleece, makes one somewhat undecided in judging just which to choose, but with some little idea of our own as to our requirements, coupled with the experience of Mr. Kent, the matter becomes simplified.

Here, again, is a complete aviation costume in black or tan leather, called the "Blériot." It is made all in one piece, is windproof, and lined all through with camel fleece. One advantage is that there are no ends to flap about and get in the way.

Those who do not happen to fancy the long leather coat as described above, will find this suit the very thing.

The Fur Cuirass, as worn by our troops at the front, is here obtainable, made in rabbit fur or goat skin.

Flying caps and helmets of every description. The pull-on, made of imitation astrachan and leather, with ear-flaps to tie under the chin. The storm cap, which is a black waterproof hood, pulled on over the head, leaving an opening in front to look through, but coming well down on to the shoulder in the form of a sleeping cap. The same thing may be had in rubber if required. The hard helmet is not so much worn now as formerly, but for those who prefer them they are here in almost every make.

Gloves for aviators are, of course, in great variety. There are the long gauntlet glove in leather, black or tan, and lined in fleece or fur, with straps to fasten across the wrist. Also the shorter glove of the same make, but coming just above the coat sleeve instead of well up the arm.



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As the inner-man, in addition to time, is pressing, and as there is an excellent restaurant in the building, we cannot do better than have lunch here before passing on to Selfridge's, our next place of call.

Again we are brought almost to a state of irresolution in our choice owing to the munificence of the display. We are fortunate, however, that in Mr. Wybrow we have an expert who has been connected with flying and motoring from the early days, and so, should it be a question of this, or of that, his experience in the knowledge of what we require cannot help but be of great assistance in forming our decision.

In black and in tan, of all usual lengths, are again to be seen those fleece-lined leather overcoats. Can there be a distinction without a difference? Under-jackets in tan leather, with sleeves, are remarkably warm, and these are fitted with wind-cuffs. In suede they may be obtained, should you not fancy leather of the faced variety, or again, in a leather which is washable, and all are lined with lambswool.

Here is a jacket, quite a short affair, coming as it does but to the waist, much after the style of an Eton jacket. It is in black leather, has sleeves, and is double-breasted. It is lined with fleece, and is just the thing to wear under an ordinary overcoat when aerodrome flying, which is generally for short periods.

Should leather be not your fancy, or if you have a leather great-coat but require something underneath, here is an under-jacket of fleece only, quite a little blanket jacket, with side pockets, which looks remarkably comfortable, and is of small price. Failing the want of a jacket, you may be fitted with a suede leather waistcoat.

A canvas overcoat is a novelty to me, yet there is one here—a long coat, absolutely waterproof, I am told, and lined with sheepskin; not quite so soft and flexible as the leather coats, but very efficient, and the price is very moderate.

And now to Dunhill's, who have opened special show rooms for aviation and service clothing and equipments at 2, Conduit Street, Regent Street. The selection of clothing here is well up to their usual standard in quality and assortment. The leather flying coat in various lengths is of course in evidence, and in addition they have some novelties of their own. One of these is a Japanese paper under-jacket. The warmth of paper as an under-garment is well known, and in this article it is utilised in the best possible manner, by making it into a jacket which is exceedingly well made, very strong, and not easily torn. The price is one which admits of replacement at frequent periods, though of course it is doubtful whether the substantial leather under-jacket be not the better

economy in the long run. In leather, they have the usual waistcoats and jackets, and in addition, those in sheepskin and fur. The Flanders Coat is one eminently suitable for soldiers' wear, who in addition to using it when flying, will want to walk about in it. It reaches just to the knees, and is made in softest tan or khaki chrome dressed leather, and has a detachable pure fleece lining. The usual pockets are provided, and it has the favourite all-round belt.

In gloves, it may be taken that Messrs. Dunhill are experts in knowing what to provide, owing to their vast experience in the wants of motorists. At Conduit Street the variety is almost unlimited, and every aviator may be sure of finding a pair to suit him.

Flying caps also are in profusion, as are also boots, leggings, and everything necessary to the flying-man.

With an industry making such gigantic strides as aviation, and whose workers are increasing so rapidly in numbers, it is not surprising that business houses who had not hitherto catered expressly for the aviation world, are rapidly falling into line, and adding a special department for this purpose. One of these, who may not at the moment be very well known amongst aviators, is Messrs. Robinson and Cleaver of Regent Street.

The stock now carried in the department is a good one, and here may be found practically all that is necessary in flying kit. In addition, they lay themselves out to supply service uniforms and equipment for officers, including camp necessities. For aviation, there is the usual assortment of flying coats and jackets. Under-vests, under-jackets, complete leather suits and what not. A speciality is a set of oilskin overalls which are waterproof, and at the price, a good substitute for the more expensive leather suits. A visit here by those interested will be time well spent.

Well, I have come to the end of our little chat on clothing, and I trust I have been able to make it interesting reading, and also that I may have been able to smooth the way a little to those who are thinking of re-fitting.

I have been able by the use of a few sketches and photographs to illustrate some of the things seen, although they convey but a poor idea of the real articles. In conclusion, I found during my round, that the old-fashioned servile, ambiguous bowing and scraping to customers used by the old-time salesman, together with the stupid mock-humble counter-language they used to use, has entirely disappeared. Those in charge, many of whom I have been able to mention by name, are straightforward business men, whose business is to see that you get exactly what you want, and not what they would like to sell. They will talk things over with you as with an old friend, and advise you to the best of their ability. It is an experience worth cultivating to have an interview with these experts in their particular sphere.



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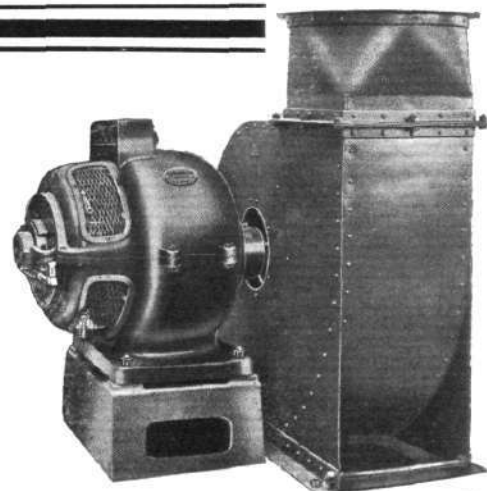
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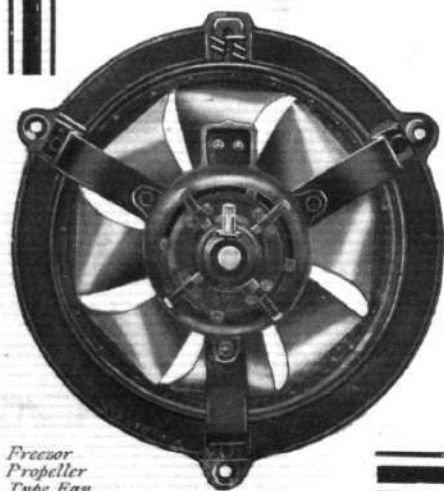
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